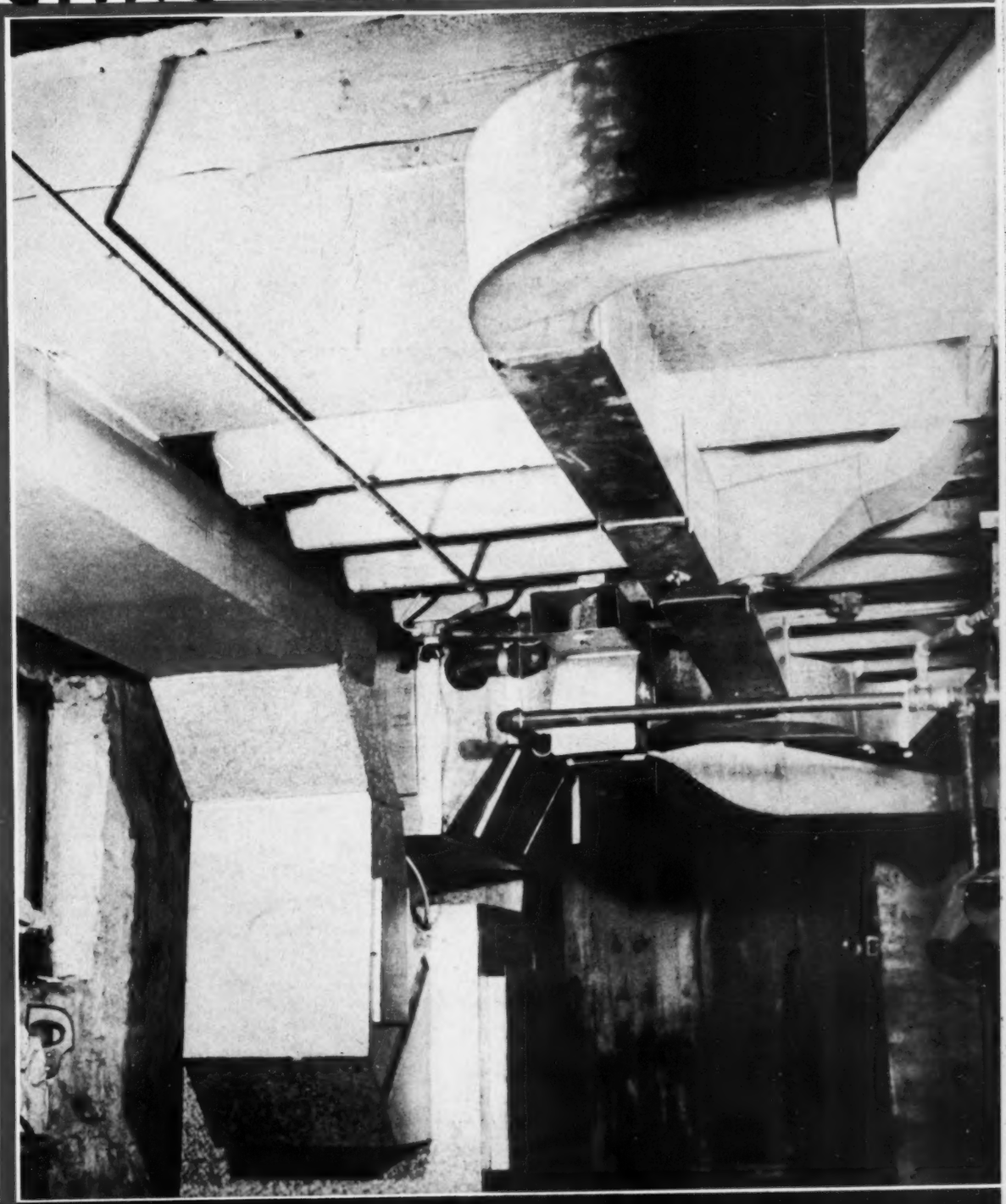
AMERICAN ARTISAN

WARM AIR HEATING • SHEET METAL CONTRACTING • AIR CONDITIONING



ESTABLISHED 1880

MARCH 1935

THE AIR CONDITIONING SECTION

Page 23

Licensed under Chemical Foundation Patents Nos. 1316817 and 1339378.

ENDURO

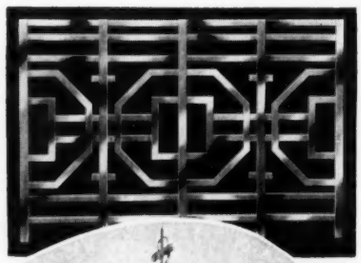
REPUBLIC'S PERFECTED STAINLESS AND HEAT-RESISTING STEELS

And now for *CHURCHES*

ENDURO—Republic's Perfected Stainless Steel—is well known to the sheet metal trade as a lastingly-beautiful decorative trim for skyscrapers, store fronts and commercial buildings generally. Now it is being used on churches.

Because of its timely interest we show here not only some of the ENDURO ornaments used on the Shrine of the Little Flower at Royal Oak, Michigan, but also the modern shop that made this work possible. It is the plant of The Sullivan-Bernhagen Co., Sheet Metal Contractors, Detroit, Michigan.

Each passing day sees new uses for this marvelous metal that is stainless all the way through. Sheet metal contractors find that it gives them something new to sell to homes, restaurants, hotels, institutions and industrial plants—and at profitable prices. Furthermore, it is easy to cut, punch, form, solder and weld. Let us send you additional information on ENDURO Stainless Steel.



Republic Steel
CORPORATION

GENERAL OFFICES · · · YOUNGSTOWN, OHIO
CENTRAL ALLOY DIVISION · · MASSILLON, OHIO

Price alone is not proof of value . . .

Compare !

Take the specification sheet of the Air Conditioner that you believe the finest built, regardless of price. Write in its features, output, ratings, etc., in the blanks provided here. Then with all the facts before you, compare it with the Hold-Heet ACA1 Air Conditioner point by point.

A mile ahead in price, the Hold-Heet ACA1 Air Conditioner is a thousand miles ahead of other air conditioners in performance and value—in Capacity, Appearance, Features, Controls, Construction . . . in all-round salability.

Take the patented Ballentine Motor alone. Any other manufacturer of air conditioners would have to add at least $25 to his cost to have an equivalent capacitor motor—the type motor electric refrigerator builders have had to come to for low starting current, low operating cost, quietness and long life. 100 speeds. Direct connected—no pulleys or belts. A motor that starts without dimming lights. The *noiseless* Planoidal Blower (twice as efficient as most)—the only blower with a published performance curve. The wide-open design coupled with double filter area (one-fourth usual filter resistance) that permits free gravity circulation; normal hot air circulation that protects the heating plant and cuts operating costs to a minimum, for blower runs only when there is heat in the bonnet.

Comparison of Air Conditioners

HOLD-HEET WINTER AIR CONDITIONER CAT. NO. ACA1	Name of finest competing unit regardless of price.
STOCK REQUIREMENTS 1 Standardized Model for the 10-room house or the small bungalow.	**STOCK REQUIREMENTS** How many models are required?
OUTPUT C.F.M. Static Pressure 3800 .....in free air 3120 .....at .05" 2500 .....at .10" 1880 .....at .15" 1240 .....at .20"	**OUTPUT**
FILTERS AREA .....2400 sq. in. RESISTANCE—.02" at 2000 c.f.m. when half loaded with dirt.	**FILTERS** Is there ample filter area for free gravity circulation?
CONTROLS FANSWITCH—line voltage type No. 3A is standard equipment. 100 SPEED CONTROL—gives any speed and output—wall and duct vibrations may be "tuned" out.	**CONTROLS** Are controls supplied? Is it convenient to vary speed with seasonal changes?
BLOWER 22" Planoidal Blower absolutely noiseless, outputs up to 3800 c.f.m. 48% static efficiency, large open design permits free gravity circulation.	**BLOWER** Is blower noisy? Is blower efficient? Does restricted size of blower prevent gravity circulation?
MOTOR 8 pole, 100 speed, 800 r.p.m. Ballentine CAPACITOR Motor starts without dimming lights, draws only 150 watts, direct connected, no belts or pulleys, oil once a year.	**MOTOR** Isn't it a high speed motor? Doesn't it draw around 300 watts? Isn't the starting current 20 amperes instead of 4? Aren't there belts to require attention?
CABINET Like a beautiful piece of furniture, rounded corners, heavy gauge, welded steel, gray enamel finish.	**CABINET**
INSTALLATION Hook-up fully assembled. Cabinet in cold air return. Install Fanswitch in furnace bonnet. Attach Control Box. (It is recommended that all air conditioner installations, regardless of make, be baffled at the furnace radiator.)	**INSTALLATION** Do you have to build a special hood? Do you have to cement in the base?
GUARANTEE "If you do not find it the finest Conditioner, regardless of price, send it back and purchase price and transportation both ways will be refunded."	**GUARANTEE** Do you know of any manufacturer that dares to give as broad a guarantee as Hold-Heet?
CONSUMER COST F. o. b. Chicago. **$84.25** Standard dealer discounts are allowed.	**CONSUMER COST** F. o. b. Chicago.

Check the Hold-Heet ACA1 feature by feature and you can come to only one conclusion—the Hold-Heet is the Air Conditioner to sell. Send the coupon TODAY for complete information.

HOLD-HEET 4-UNIT WINTER AIR CONDITIONING AND SUMMER COOLING

Unit No. 1—Automatic Temperature and Combustion Control.
Unit No. 2—Automatic Humidity Supply and Control.
Unit No. 3—Air Cleaning and Circulation.
Unit No. 4—Summer Cooling.

Equipment and controls for every type of home heating plant purchasable one unit-at-a-time (like a sectional bookcase).

RUSSELL ELECTRIC CO., Mfrs., 342 W. Huron St., CHICAGO, U. S. A

Invaluable Information for Every Heating Man FREE—Just pin this Coupon to your letterhead.

RUSSELL ELECTRIC CO.
342 West Huron Street, Chicago, Ill.

☐ Send complete new catalog with full data on Hold-Heet 4-Unit Air Conditioning.
☐ Send dealer price list (this list is only supplied when your regular business letterhead or a full explanation shows you are entitled thereto).

Send to .....

Name of Firm .....

Address .....

City..... State.....

Name of Preferred Jobber.....

Covering All Activities
in
Gravity Warm Air Heating
Forced Warm Air Heating
Sheet Metal Contracting
Air Conditioning
Ventilating
Roofing

AMERICAN ARTISAN

With which is merged

FURNACES AND SHEET METALS AND Warm-Air Heating

Vol. 104, No. 3 March, 1935 Founded 1880

NRA CODE

Published Monthly by
Keeney Publishing Company
6 North Michigan Ave., Chicago
State 6916

Branch Offices

New York
Room 1735
Grand Central Terminal Bldg.
Murray Hill 2-8293

Cleveland
2047 Rossmoor Rd.
Cleveland Hts.
Yellowstone 1540

J. D. WILDER
Editor

Advertising Staff
WALLACE J. OSBORN
R. PAYNE WETTSTEIN
ROBERT A. JACK

Copyright 1935 by
Keeney Publishing Company

F. P. KEENEY
President
W. J. OSBORN
Vice President
R. PAYNE WETTSTEIN
Secretary
CHAS. E. PRICE
Treasurer

Member of Audit Bureau of Circulations
Member Associated Business Papers, Inc.

***Yearly Subscription Price*—U. S. and possessions, $2.00; Canada, $3.00; Other countries, $4.00. Single copies, $.25. Back numbers $.50 Entered as second-class matter, July 29, 1932, at the Post Office at Chicago, Illinois under the act of March 3, 1879.**

CONTENTS

The Sheet Metal and Roofing Conference at Cincinnati 11
An announcement.

Gutter and Flashing Details of World's Largest Distillery 12
Fabrication and erection information on one of last summer's interesting sheet metal projects.

National, Regional and Local Code Authority Budgets for 1935 14
The budget for 1935, now up for approval, is itemized so you can see how much code compliance will cost in your area.

Hand Fabrication of Copper Kettles 17
If you believe hand fabrication of copper utensils is a lost art you will be interested in this description of craftsmanship still in use.

Ventilation for a Chromium Plating Plant 20
The ventilation of chromium plating vats is a ticklish problem. We show here several practical methods.

Sheet Metal Sign Advertises California Shop 20
Details of the construction of an unusual array of metal advertising signs made by a contractor.

The Michigan State Convention 21
The code—past, present and future—is debated at the Michigan convention. We report some of the lively sessions.

The Air Conditioning Section 23

Forced Air Heating Facts from the Research Residence 30
S. Konzo continues his excellent series, this time discussing room temperature gradients and air temperatures. An unusually interesting and valuable article.

An Alignment Chart for the Mechanical Code 32
If you followed and adopted Mr. Kroeker's previous charts you will surely want to use this chart which makes the Mechanical Code a purely mechanical calculation.

Automatic Control for Air Conditioning Systems 34
We continue our discussion of zone operation and control and itemize details of two popular variations of the basic hookup.

Fabrication of the Test House Duct Work 36
Many requests for specific information on the fabrication of the American Artisan Test House duct work have been received. We explain here how the job was surveyed and fabricated.

Oil Smell—A Common Trouble and a Suggested Remedy 38
Ever have oil smell in one of your automatic oil jobs? This contractor did, but he went farther and worked out a remedy. He tells all about it.

The Problem Corner 51
Some interesting problems and suggested answers.

Code Authority Committee Reports 53
Several active authorities report important developments which should be of interest to all zones.

Association Activities 54

Letters from Readers 56

New Products 58

News Items 64

With the Manufacturers 68

New Literature 70

More than 7,000 copies of this issue are being distributed.

WE ARE CO-OPERATING
BETTER HOUSING PROGRAM

Business for You

IN THE N. H. A. PROGRAM

Sheet metal work in this condition—your opportunity to sell copper

THE NATIONAL HOUSING ACT has already stimulated modernization and new home building. And, this year, activity in the construction industry promises to hit its stride.

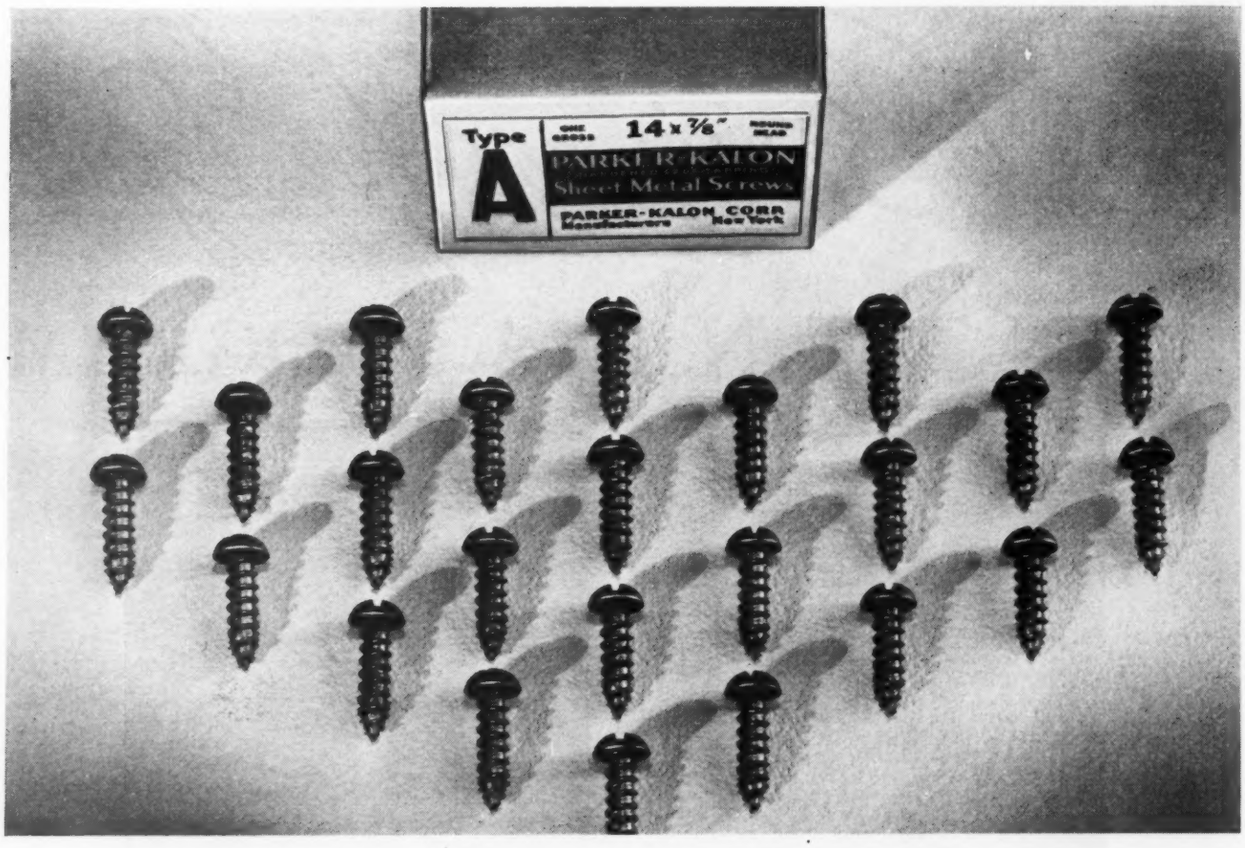
A building revival means opportunity for you. It will be easier for you to *get your share* of the business if you recommend and push the sale of durable materials such as Anaconda Copper.

The trend today is toward longer term mortgages. It is obviously wasteful to borrow long term money to pay for short-lived materials. This provides *you* with an unusual opportunity to profit from quality construction with lasting materials. Successful contractors have told us time and again that Anaconda Copper is easier to sell than other brands because it represents known value...and is accepted everywhere as the standard of sheet metal quality. Leading sheet metal supply houses carry Anaconda Copper in sheets and rolls, and copper gutters, leaders, elbows and shoes trademarked ANACONDA.

•

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Connecticut
Offices and Agencies in Principal Cities

ANACONDA COPPER



Pick Any One— *they're ALL Good!*

. . . because they're made by Parker-Kalon

To make Screws that "look" like genuine Parker-Kalon Sheet Metal Screws is easy . . . but it is another thing to make them *uniformly good.* That's why it pays to say "PARKER-KALON" when you buy screws for assembling sheet metal.

You can pick any one of the Screws out of a box labeled, "Parker-Kalon Type 'A' Hardened Self-tapping Sheet Metal Screws", and be sure that it will work perfectly. There won't be a single poor one to cause trouble and waste your time.

Try These Parker-Kalon Screws, too

Type "Z" Sheet Metal Screws are better than the Type "A" for many jobs. They can be used for assembling sheet metal from 28 gauge up to 6 gauge; making fastenings to aluminum, die castings, Bakelite, slate, etc. Try them.

Hex Head Self-tapping Cap Screws are excellent for fastenings to sheet metal up to 6 gauge, and to steel plate and structural shapes up to ½ in. Turn them in with an end or socket wrench.

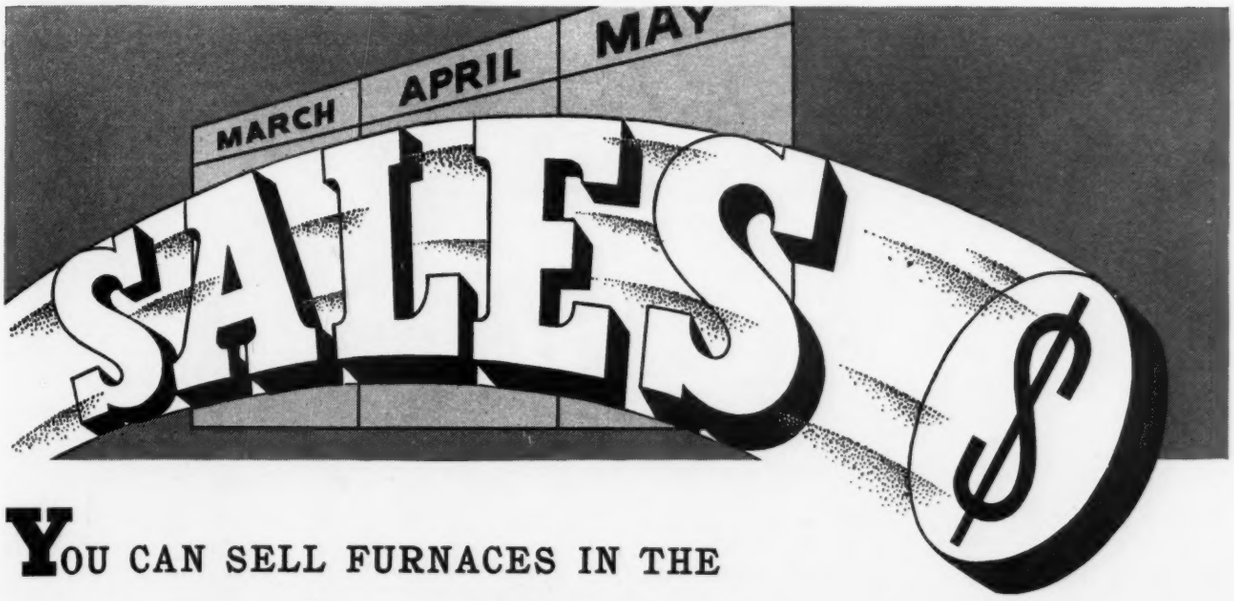
Genuine Parker-Kalon Sheet Metal Screws *always* go in easily and quickly . . . form a perfect, strong-holding thread . . . draw up tight without breaking. They're ALL good because Parker-Kalon's unique equipment, special hardening process and special analysis wire . . . and 20 years of experience in making Self-tapping Screws . . . assures uniform quality and uniformly correct size and form.

Remember Genuine Sheet Metal Screws are made ONLY by Parker-Kalon. To make sure of savings ask for them by name.

PARKER-KALON CORPORATION
190 Varick Street New York, N. Y.

PARKER-KALON
HARDENED TYPE A SELF-TAPPING
Sheet Metal Screws
PATENTED NO. 1465148

Genuine Sheet Metal Screws Are Sold Only By Recognized Distributors



YOU CAN SELL FURNACES IN THE SPRING THROUGH THE SUNBEAM FINANCE PLAN

WE ARE CO-OPERATING BETTER HOUSING PROGRAM

in connection with federal housing administration

A good time payment plan will enable the aggressive heating contractor to make sales in most any month of the year. The best finance plan ever offered, The Sunbeam Plan in connection with Federal Housing Administration, is enabling Sunbeam dealers to close sales now. Home owners who need new heating equipment, and there are hundreds of thousands of them, are responding to the argument—"the sooner you start paying, the sooner your furnace is paid for" —and "it is easier to make payments in the summer when your regular expenses are lowest."

The Sunbeam Finance Plan makes heating sales easy to obtain because it requires no down payment from the home owner—monthly payments as low as $10, with as long as 3 years to pay, at the lowest rates in history. Simplified Forms that can be quickly filled out right in the prospect's own home are provided. The coupon will bring you complete details; also the name of the Sunbeam Jobber near you who carries a stock of Sunbeam Furnaces.

SUNBEAM
WARM AIR FURNACES AND AIR CONDITIONING UNITS

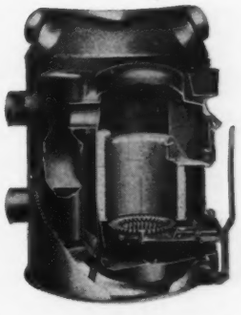
Interior View of Cast Iron Furnace

SUNBEAM CAST IRON FURNACES

are made in 7 sizes from 18" to 30". They have a one-piece radiator; slip-over fronts; duplex grates; one-piece base; extra heavy fire pot.

SUNBEAM STEEL FURNACES

are available in 6 sizes, from 20" to 34". They have duplex grates; full height fire pot; direct draft damper outside of casing; no direct connection between drum and casing.



Interior View of Steel Furnace

The Fox Furnace Company,
Elyria, Ohio.

Please send complete information on the Sunbeam Finance Plan so that we can benefit from the Government's efforts to assist heating contractors. Give us also the name of a nearby Sunbeam Jobber.

Name .....

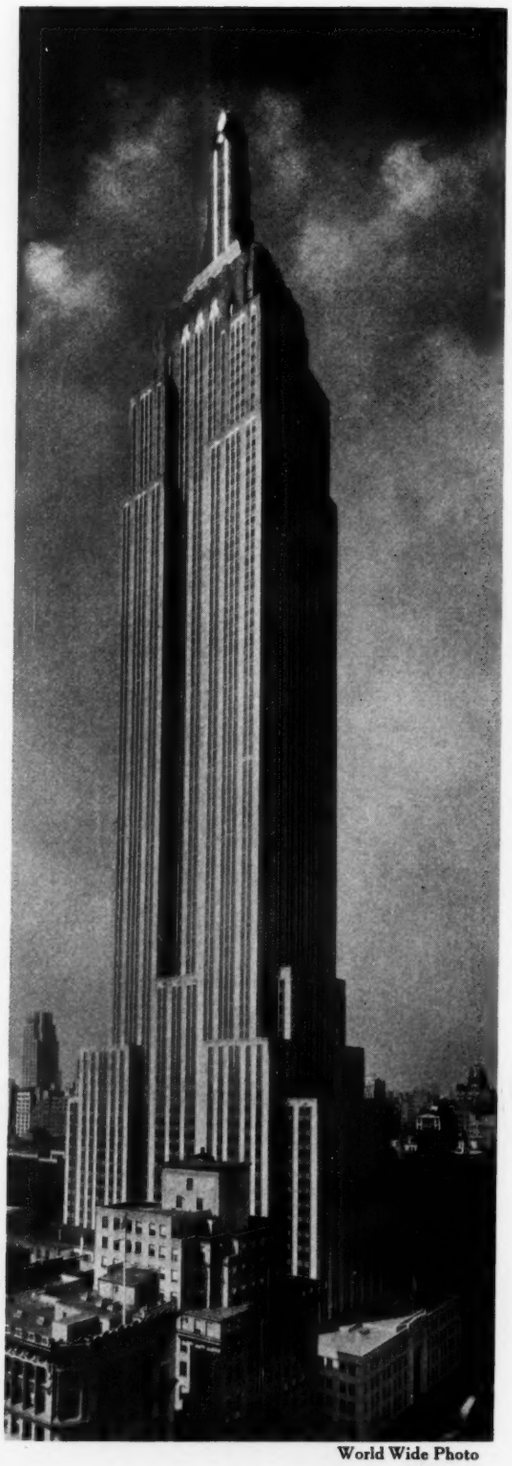
Address .....

City and State.....

A-3

THE FOX FURNACE CO. ELYRIA, O. A DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORP.

Where STRENGTH *Joins with Beauty*



World Wide Photo

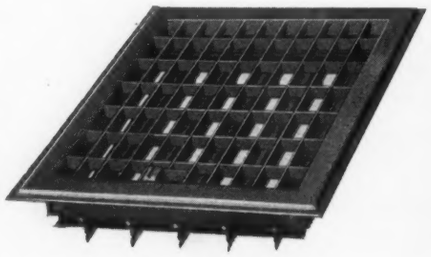
Were it not for fabricated construction, there would be no Empire State Building, the marvel of the architectural world.

Without fabricated construction, it would be impossible to attain in floor registers and cold air faces the strength, rigidity and efficiency available in Independent "Fabrikated."

Independent "Fabrikated" Floor Registers and Cold Air Faces are the original fabricated. They afford the very maximum of strength, rigidity and large open area, 82 per cent or more. Their fine appearance, too, has contributed to enhance warm air heating in public favor.

INDEPENDENT REGISTER & MFG. CO.
3741 East 93rd St., Cleveland, Ohio

Send for catalogs of floor registers, cold air faces and grilles.

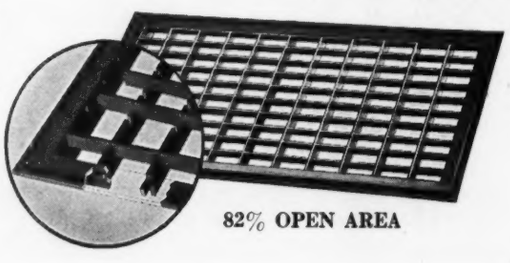


INDEPENDENT "Fabrikated"

(Reg. U. S. Pat. Off.)

Floor Registers and Cold Air Faces

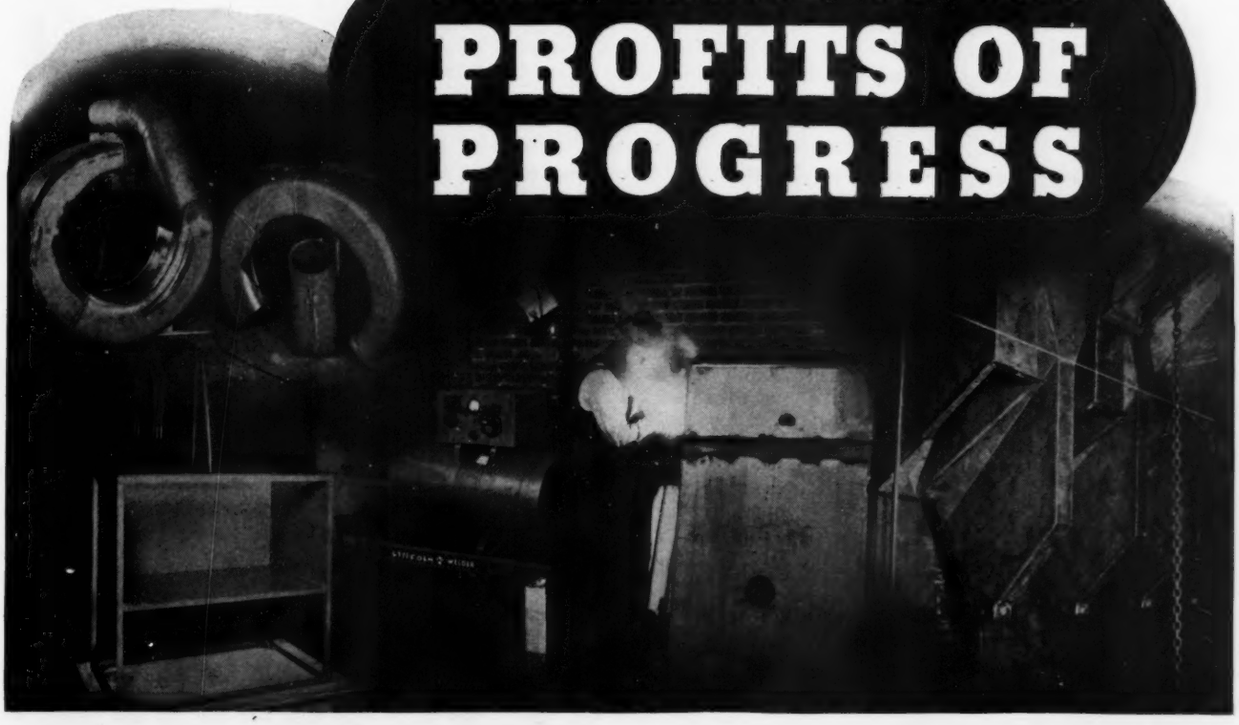
Forced Air Registers and Grilles



82% OPEN AREA

Any Size . . . Any Finish

HOW TO GET YOUR SHARE OF THE PROFITS OF PROGRESS



BECAUSE tradition pays no dividends, many a sheet metal shop has turned to shield arc-welded construction for product improvement and more sales . . . the profits of progress. These profits are yours whenever and wherever you use this better method of fabrication.

Strength and rigidity are increased . . . weight is reduced . . . because shield-arc welding allows you to take full advantage of the physical properties of sheets and shapes. No punching is required. Fabrication costs are reduced as much as 35% and often more on many jobs. Shield-arc welding is easier to use. Goes into production faster and allows quick changes in design at minimum cost.

But the necessary element is the *"Shield-Arc"* welder... guaranteed three ways to produce more welding per dollar, whether you weld 24-gauge sheets or the heaviest plates and shapes. *"Shield-Arc's"* extra wide welding range with no "blind spots" allows you to weld all work with a single machine. Its uniform current and greater efficiency plus nine other features make the *"Shield-Arc"* a faster and more economical welder. The new 75-amp. a-c motor driven welder is especially designed for sheet metal work—and sells for only $250. Find out now how the *"Shield-Arc"* can give you a bigger share of the profits of progress. Send in the coupon to The Lincoln Electric Company, Cleveland, Ohio, the largest manufacturers of arc welding equipment in the world.

LINCOLN

"SHIELD-ARC" WELDERS

W-123

THE LINCOLN ELECTRIC COMPANY, Cleveland, Ohio

Yes, I'm very much interested in *"Shield-Arc"* welding. I have checked what I want.

- ☐ Complete information on welders by mail
- ☐ I am particularly interested in the $250 machine
- ☐ Have your representative call

We now use arc welding ☐ Send complete procedures for welding:

- ☐ thin gauge sheets ☐ mild steel ☐ stainless steel
- ☐ aluminum ☐ cast iron

No Obligation—Check and Return Today

Firm Name _____

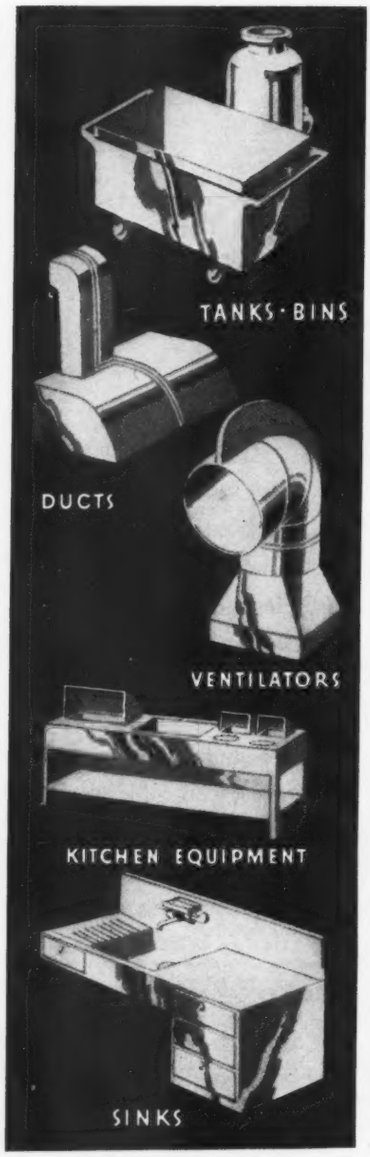
Your Name _____

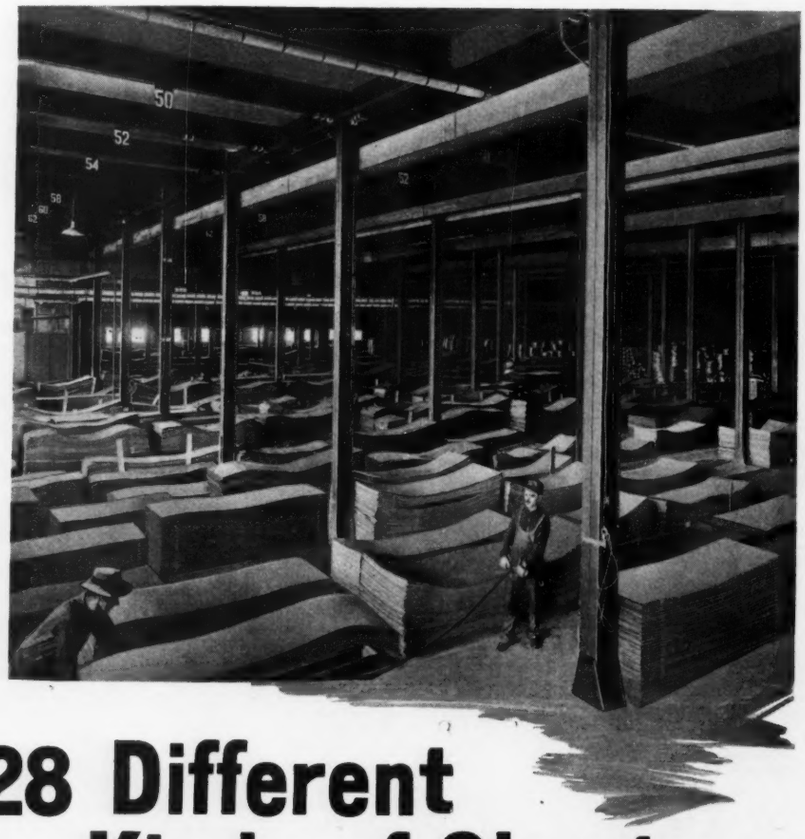
Street _____

City _____ State _____

Get New Business with Allegheny Stainless

Allegheny Time Tested Stainless Steel opens new fields to the sheet metal men. Unrusting, unstaining, untarnishing—yet ductile, easy working and strong. When you need Stainless specify Allegheny Metal. In stock at all Ryerson Plants. Immediate Shipment.





28 Different Kinds of Sheets

In Stock for Immediate Shipment

Making it Easy to Select the Right Sheet for Every Purpose

Select the best sheet for each particular job. You can get it immediately from the nearest Ryerson plant. In addition to the wide range of steel sheets, copper, brass and other non-ferrous metals are also in stock. One order can cover the majority of requirements—from sheets, angles, rivets, bolts, welding rod, etc., to sheet metal working tools. Combine your orders and save office work, time, trouble and money.

The Ryerson Stock List is your guide to immediate steel. If you haven't the current copy, we will be glad to send it.

PARTIAL LIST OF SHEETS CARRIED IN STOCK

Abrasion Resisting	Electrical	Locomotive Jacket
Allegheny Stainless Steel	Enameling	Long Terne
Armco Ingot Iron	Eraydo	Perforated
Blue Annealed	Galvanized	Radio Transformer
Bullet Proof	Panel & Sign	Stretcher Levelled
Copper Bearing	Galvannealed	Tool Steel
Corrugated	Heavy Hot Rolled	Uniform Blue
Deep Drawing	High Carbon	Vitreous Enameling
Dynamo	Hot Rolled, Annealed	Wellsville Polished

JOSEPH T. RYERSON & SON, Inc.—CHICAGO—MILWAUKEE—ST. LOUIS—CINCINNATI —DETROIT—CLEVELAND—BUFFALO—PHILADELPHIA—BOSTON—JERSEY CITY

RYERSON

STEEL-SERVICE

Volume 104

Number 3

AMERICAN ARTISAN

Come to Cincinnati April 2, 3, 4, 5

MARK these dates on your calendar—April 2, 3, 4, and 5.

These are the days of the annual conference of the sheet metal, warm air heating, and roofing industries.

The city is Cincinnati, Ohio. The meeting place, Netherland Plaza hotel.

At this meeting a new National Code Authority Committee will be elected. Also, all of the small and big problems which have been annoying the industry and the individual contractor will be aired. Special sessions will be given over to discussions of these problems of the code.

This meeting should be considered highly important, if you have any interest at all in the code and your association.

Bear the following facts in mind. Present them at your next association meeting. Determine what you and your organization propose to do.

Much complaint has been heard regarding last year's election of the National Code Authority. Some zones want a new member. Some men want a larger national committee. Each member has been made responsible for organization work in his area—a scheme which was not contemplated when the authority was elected last year.

If the industry is to get anywhere with codes, the national committeeman responsible for any given area must be respected by members of the industry in that area. They must be willing to work for him; he must be willing to work with them. Perhaps we need more members on our national authority. If so, now is the time to elect them.

The National Code Authority to be elected next month will not take office until the present committee has served its year. This will be May 25th, one year from time of the committee's approval; not one year from the time the election was held.

Any firm engaged in any one or more of the crafts covered by our code is automatically a member of this conference. BUT—this does not mean that any individual or firm can VOTE for the new National Code Authority.

THE ONLY MEMBERS ELIGIBLE TO VOTE ARE THOSE MEMBERS WHO ARE IN FULL CODE COMPLIANCE.

THIS MEANS THOSE WHO HAVE PAID THEIR ASSESSMENT.

This means the assessment for the three months period of 1934.

The National Code Authority representative for your area can be elected at this conference IF THERE ISN'T A SINGLE MEMBER FROM THE AREA PRESENT.

Organizations interested in this election should send delegates. And these delegates should be in full code compliance, by reason of having paid their assessment. Further, these representatives should carry with them the certified proxies of all members in their organization or area who are a'so in full compliance, but who cannot attend.

Official proxies and credential blanks will be sent to every local code administration board. If you operate in an area where there is no local administration board, your blanks should come to you from the Pittsburgh National office.

Write for blanks, if you do not get them.

By the time this conference convenes, the industry should have authoritative rulings on many of the troublesome problems so far undecided. The men who have been close to Washington and NRA will attend in person to guarantee that these problems will be worked out. The rate of assessment, X36, guarantees, bid depositories, code enforcement are some of the things which can be definitely settled if this conference is well attended.

To expedite business the conference will proceed as follows:

The National Association of Sheet Metal Contractors will hold their annual convention April 2, 3 and 4.

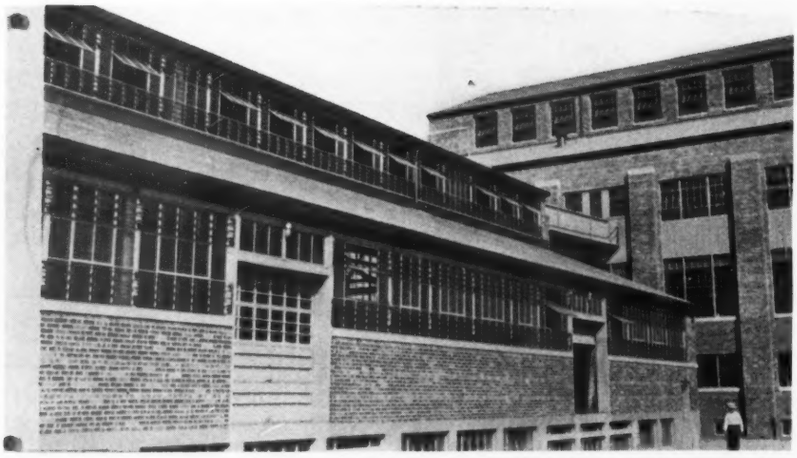
The Roofing Contractors Division of the National Slate Association will hold their annual meetings April 3 and 4.

The United Roofing Contractors Association will hold technical sessions on built-up and flat roofing April 4.

Code compliance and enforcement will be taken up in the opening session on April 3.

A general session of all crafts in the industry will be held on April 5 at which time the National Code Authority for the Roofing and Sheet Metal Contractors will be elected.

If any questions you have in mind have not been answered write to the local code authority committeeman in your area. If there is no local committee, write to your state or national committeeman. Or write to Executive Manager of the National Code Authority, Warner S. Hays, 644 Drexel Building, Philadelphia.



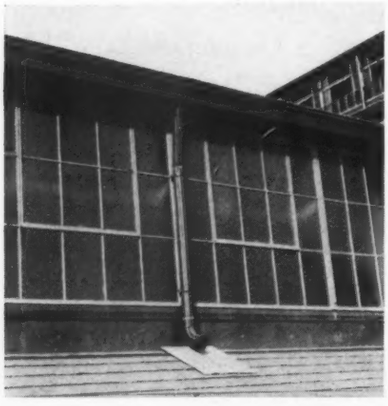
Left—Looking down a building face showing the gutter, metal-faced monitor and downspouts described in this article.

Gutter and Flashing Details of World's Largest Distillery

EARLY last summer there was opened in Peoria, Illinois, one of the largest distilleries in the world—that of the Hiram Walker Company. Since these first units were opened last summer, additional buildings have been started and still others are contemplated for the future.

Every building on the property is entirely new, the design calling for the latest in construction methods and for the very best materials and methods of application. Each building is fire-proof throughout with concrete and steel framing, brick exterior walls, asbestos - cement shingles on Holorib metal sheathing with 1½ inches of insulating material between the sheathing and the shingles and copper metal work. The handling of the copper metal work is an interesting story.

The copper contract was secured by Fred Hauer & Company, Inc., of Peoria. The work consisted of copper gutters, copper flashing, copper sheathed eaves, copper conductor pipe and heads and two aluminum ventilating towers.



Downspouts are corrugated, round, turned out upon a drip plate and let directly into the gutter bottom. Note nailing of monitor flashing.

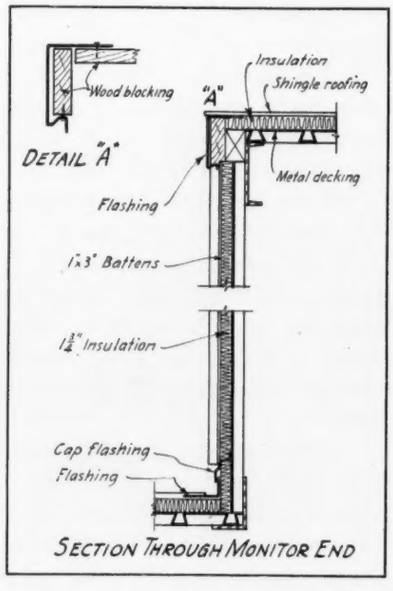
The Gutters

The photographs and details show the general construction of the gutters. These gutters are exactly alike on all buildings. For the buildings completed last summer, 8,128 linear feet of 24-inch gutter was required. All the gutter was fabricated from 16-ounce copper. As shown in the details, the gutter consists of a one-piece section with a back side cap flashing. The back edge of the gutter proper is carried up to a point higher than the gutter front; out across the bottom; up the front face and turned for a ⅜x¾-inch reinforcing bar. The cap flashing comes down just beyond the half height point and is held under the shingles by nailing clips.

The gutter was fabricated in a field shop in 10-foot lengths. Then two 10-foot sections were soldered and riveted together so a 20-foot section could be hung as a unit. Then all sections were soldered and riveted so that each run of gutter is a solid unit between expansion joints.

The expansion joints are located at the high points; these high points being selected according to the length of the building. The type of expansion joint used consists of solid ends soldered into the gutter. The ends are held apart slightly, the spacing depending, again, on the length of the adjoining sections. A saddle covers the top of the gutter across the expansion joint. The reinforcing bar in the outside edge was turned into the copper as each 20-foot section was fabricated. There is no connection between the bars of adjoining sections. Each joint has a sleeve to hold the ends in place but allows the bars to move slightly.

The gutter projects beyond the exterior wall as shown in the photographs. Straps, of a size indicated in one of the details are located at 36-inch intervals for support. The



End eaves of all buildings are flashed as shown in these details. Note use of insulation in walls and roofs.

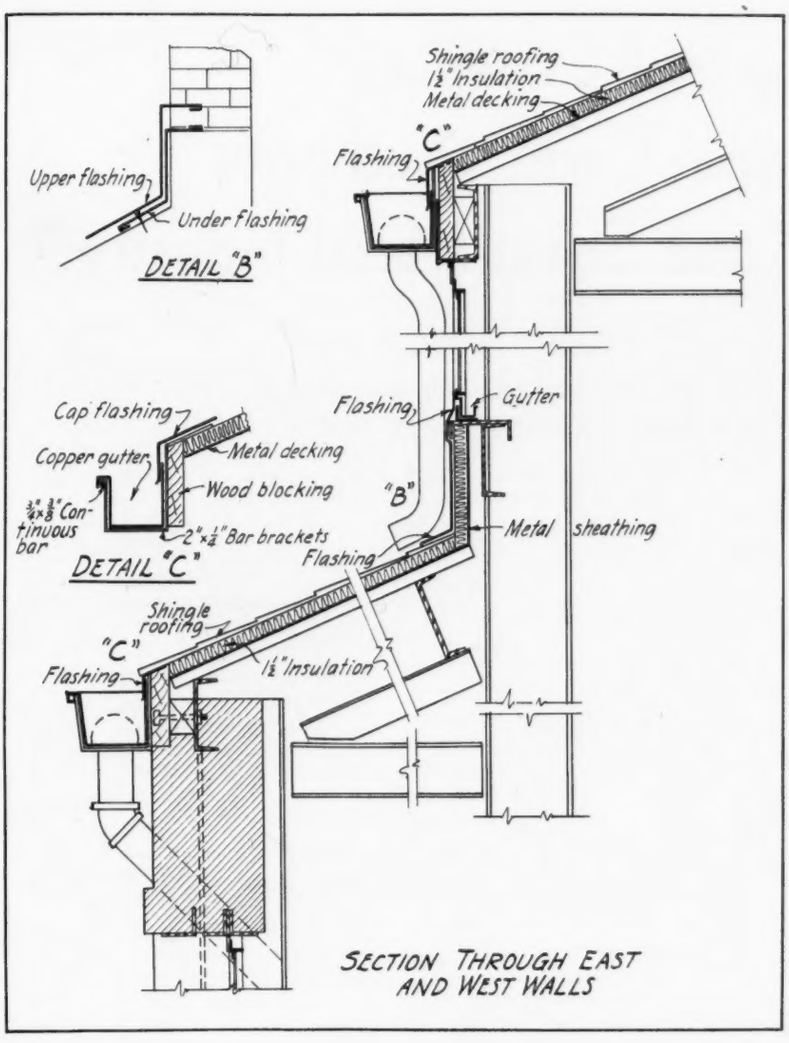


Fig. 1—Details of gutter formation, flashing application and building construction. Base flashing is identical for brick and metal monitors.

straps are riveted to outer reinforcing bar and carried back under the gutter and up under the shingles and fastened to facia board with two number 12 by 1½-inch screws.

Flashings

Included in the contract were two types of flashing. The first type was placed along the bottom of the monitors which form the peak of all building roofs (see photographs). In some cases these monitors are completely metal faced (see Fig. 1), while some other monitors are brick faced around the windows. In both cases the flashing used is of the same dimension and type.

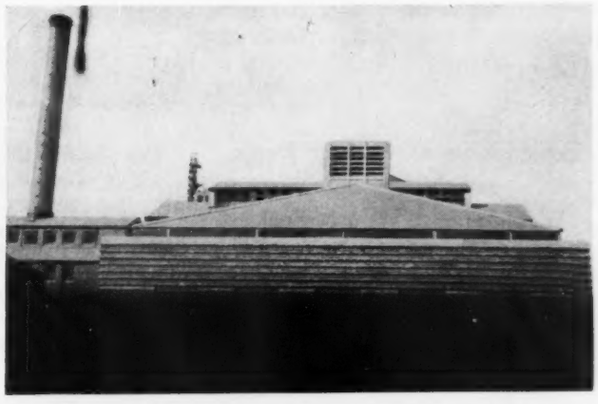
This flashing is two piece. One of the details shows the construction clearly. The under flashing is anchored into the first course of brick or into the structural frame on the metalled monitors; carried down the face of the monitor for about 8 inches; then slanted down over the insulation and under the shingles. The apron is nailed into the insulation. This flashing was formed from a single 15-inch strip of copper.

The outer flashing sheet is slipped into a slip joint of the under flashing as shown in the detail and follows the under flashing down the face of the monitor, but the apron extends several inches below the end of the under flashing. The lower edge is turned under for spring. This outer flashing is placed on top of the shingles of the roof. The outer flashing is held tight against wind by storm nails driven into the vertical face as shown in one of the photographs.

A considerable amount of cap

(*Continued on page 69*)

Where brick walls rise above sloping roofs the flashing was applied as shown in this photograph.



The administration building uses two aluminum sheathed towers for the air conditioning system. Text explains fabrication and erection.

Budget of Expenses for Divisional Code Authority of the Roofing and Sheet Metal Industry

THE accompanying budget for the Divisional Code Authority of the Roofing and Sheet Metal Contracting Industry is prepared on the basis of the estimated expenditures for 12 months period, covering expenses of Divisional Code Authority only. The expenses of Regional and/or State and Local Boards, are summarized in this report.

From the best facts available and other information we have been able to secure, we estimate this Industry normally does an annual business of $1,250,000,000. Assuming construction to be still 15% of normal, we would have a present business amounting to $187,500,000. Allowing an additional 20% for shrinkage, we have a potential amount of $150,000,000 upon which to levy assessments.

Beginning in February, 1935, we propose to assess monthly on previous month's business done by each Member of the Division at the rate of ¼ of 1%. It is hoped volume of business reported will increase and sufficient number of Members will pay promptly, so that this reduced rate of assessment will produce adequate funds in the National Treasury to pay the budgetary items.

Explanation of Budget Items

Salaries

The amount of time the officers will devote to Code work, will be dependent upon the demands of the Code and the amount of funds available with which to pay them.

The Chairman and Secretary-Treasurer are receiving no compensation from any other Code Authority. The Executive Manager is also Secretary of The Slate Industry Code Authority

BUDGET

January 26, 1935 to January 31, 1936

I. NATIONAL CODE AUTHORITY EXPENSES			
A. Salaries:			
1. Executive Secretary-Treasurer	$ 7,500.00		
2. Other Executive Officers			
(a) Chairman	4,000.00		
(b) Executive Manager	7,500.00		
(c) Members of National Code Authority attending meetings such Body	6,600.00		
3. Clerican Employees and Field Investigators	15,000.00		
			$40,600.00
B. Office Expenses:			
1. Rent and Light	2,000.00		
2. Office Equipment	1,000.00		
3. Office Supplies	3,000.00		
4. Stationery, Printing and Postage	30,000.00		
5. Telephone and Telegram	2,000.00		
			$38,000.00
C. Traveling Expenses:			
1. Members Code Authority	8,400.00		
2. Executive Officers	8,000.00		
3. Employees	1,500.00		
			$17,900.00
D. Incidentals:			
1. Legal Fees	15,000.00		
2. Accountants	1,000.00		
3. Insurance and Bonds	500.00		
4. Educational and Publicity Expenses	7,000.00		
5. Expense of Incorporating and Registering Code Authority	3,300.00		
			$26,800.00
II. COMMITTEES AND FACILITIES THEREOF			
A. Trade Practice Complaints Committee	20,000.00		
B. Labor Relations Committee	10,000.00		
			$30,000.00
C. Other Committees:			
1. Finance	5,000.00		
2. Statistics and Reports	2,500.00		
3. Accounting Systems and Methods	5,000.00		
4. Standards of Safety and Health	2,500.00		
			$15,000.00
III. CODE AUTHORITY ZONE OFFICES			
Organization and administration Expense of Code Authority Zone offices, including travel expense, clerical expense, postage, etc.			48,000.00
IV. EXPENSES OF 3 REPRESENTATIVES-AT-LARGE			
Estimated expenses including offices, travel and clerical expense, postage, each			5,250.00
V. CONTINGENT RESERVE FUND FOR UNFORESEEN EXPENSES			10,000.00
VI. TOTAL DIVISIONAL CODE AUTHORITY BUDGET			
A. Total of Items I to V			$231,550.00
B. Contribution to Const. Code Authority			23,155.00
			$254,705.00
VII. REIMBURSEMENT OF EXPENSE OF CODE PREPARATIONS EXPENSE BORNE BY INDIVIDUALS			
Balance still due of previous Budgetary item			$18,300.00

(*Continued on Next Page*)

which, like this Code Authority has as yet no funds available for payment of salaries, and prospects of collection are exceedingly doubtful, slow and uncertain. When, as and if the time comes that salary to the Secretary can be paid, the total budgeted salaries earned from these two Code Authorities will not exceed $10,000.

In arriving at Code Authority expenses, it has been estimated that 4 meetings of the Code Authority would be held per year. The average number of days required for traveling and attendance would be 6 days, totaling 24 days per member × 11 members equals 264 days, at $25 per diem, totaling $6,600.

Clerical employees and field investigators covers office force at headquarters of the Code, 429 Fourth Avenue, Pittsburgh, Pa., and in the Drexel Building, Philadelphia, Pa., with an allowance for special investigations by field investigators.

Office Expenses

These are made up of the usual operating expenses with a larger item of stationery, printing and postage covering Bulletins, copies of Code and other information which will be mailed to the Industry from time to time.

Traveling Expenses

It is estimated that the traveling expenses per member of the Code Authority will average $175 per meeting, × 12 members equals $2,100 × four meetings totals $8,400.

Other traveling expenses covering executive officers and employees will cover their attendance at Code meetings and such other traveling expenses as they will have.

Incidentals

Legal fees may seem low but items we have in for trade practice and labor relations committees will likewise cover some legal fees.

Expenses of Incorporating the Code Authority

This item may seem high, but we contemplate registering the corporation which was incorporated during our first budgetary period, in the various states of the Union which will require approximately the amount estimated.

Summary of National Divisional Code Administrative Budget

January 26, 1935 to January 31, 1936

I.	**NATIONAL CODE AUTHORITY EXPENSES:**		
	A. Salaries	$40,600.00	
	B. Office Expenses	38,000.00	
	C. Traveling Expenses	17,900.00	
	D. Incidental Expenses	26,800.00	
			$123,300.00
II.	**COMMITTEES AND FACILITIES THEREOF**		46,000.00
III.	**CODE AUTHORITY ZONE OFFICES**		48,000.00
IV.	**EXPENSES OF 3 REPRESENTATIVES-AT-LARGE**		5,250.00
V.	**CONTINGENT RESERVE FUND FOR UNFORESEEN EXPENSES**		10,000.00
VI.	**TOTAL DIVISIONAL CODE AUTHORITY BUDGET**		254,705.00
VII.	**REIMBURSEMENT OF EXPENSE OF CODE PREPARATIONS EXPENSE BORNE BY INDIVIDUALS**		18,300.00

Expenses of Zone Offices

With no money yet available in the Treasury, it is impossible for us to employ and assure payment of salaries to employees for the purpose of completing the organization of the Industry into regional, state and local Code Boards. Therefore, from the standpoint of economy, the Code Authority has selected members of the Code Authority to represent it in the zone from which the individual member was elected. We again estimate that the zone representatives will average 80 days per year, at a per diem basis of $25 for continuing this work. It is estimated that the expense of the zone representatives will total not more than $30,000.00 for the 11 zones. This is not to be considered as a salary and expense but is a reimbursement of actual expenses and a limited per diem charge only to cover such work as is actually required to get established the various Boards in each zone, and to supervise their proper administration.

It is hoped the Boards established will operate so efficiently the services of the Zone Representative will not be required for the number of days estimated and part of this amount will not be expended.

Expenses of Members-at-Large

The members-at-large will be used to assist zone representatives on problems in their particular line, and it is estimated that they will be engaged approximately 30 days each during this budgetary period, at $25 per diem. The expense of these members-at-large is problematic but we have estimated them to the best of our ability.

Contingent Reserve Fund

This fund is to cover such items as are not included or which may somewhat exceed the estimated amount.

General

As stated elsewhere, this industry is not well organized with trade associations, etc., like the Painters' Club, the Plumbing Associations, the Electrical Associations, therefore our entire budget is an estimate from such facts as are available, but we have had to make assumption in a great many cases.

We cannot yet give you the accurate number of firms subject to assessment, as this information is not available from sources known to us.

This Budget for a 12 month period in most items and in total is a substantial reduction over previous approved 6 months budget if it were doubled for Divisional Code Authority items.

The items contained in the foregoing budget are proper and correct and the proposed expenditures and assessments were duly approved by the Finance and Budget Committee and the Executive Committee acting under authority delegated to them by the Divisional Code Authority at a Divisional Code Authority meeting held in Chicago, July 20, 1934.

Regional, State and Local Budgets Follow

Regional, State, Local Budgets

The accompanying budget summaries are prepared on the basis of the estimated expenditures for a twelve month period for all Regional and/or State and Local Boards.

Beginning in February, 1935, to obtain necessary funds, it is proposed to assess monthly, payable by the fifteenth of each month, on the gross business done during the preceding month by each Member of the Division, the different percentages as shown in this Exhibit. These assessments are in addition to the ¼ of 1% necessary for the expenses of the Divisional Code Authority as shown by Exhibit A.

AREA			BUDGET ITEMS						
Zone	Regional or State	Local Board	Salaries	Office Expenses	Traveling	Incidentals	Contingencies Legal, etc.	Total	Top Assessment Rate of 1%
1	New England		$ 500	$ 500	$ 1,000	.....	$ 500	$ 2,500	1/2
		N. E. Mass.	2,050	1,200	50	$ 150	550	4,000	1/2
		S. E. Mass.	1,400	1,170	900	300	400	4,170	1/2
		West Mass.	3,500	1,100	1,500	250	200	6,550	1/2
		Central Mass.	2,000	1,100	1,000	1,000	900	6,000	1/2
		Boston, Mass.	6,700	2,600	300	1,500	1,300	12,400	3/10
	Maine		5,000	1,150	1,000	....	300	7,450	1/2
	Rhode Island		5,500	1,700	800	1,000	1,000	10,000	1/2
	New Hampshire and Vermont		3,640	1,300	1,500	160	1,400	8,000	
		S. W. Conn.	4,160	1,765	1,275	250	550	8,000	1/2
		N. E. Conn.	4,130	1,660	1,510	250	450	8,000	1/2
								$77,070	
2	New York and 6 Boards (except part in Zone 3).		28,000	7,868	3,500	700	3,500	$43,568	1/2
3	Metropolitan N. Y.		24,500	11,300	3,000	2,200	31,000	$72,000	1/4
4		Philadelphia	9,300	3,700	1,720	750	500	15,970	3/10
		N. E. Penna.	3,128	240	300	120	300	4,088	1/2
		Reading	1,500	240	300	120	300	2,460	1/2
		Lehigh Valley	1,500	240	300	120	300	2,460	1/2
		Central Penna.	3,120	1,405	900	175	400	6,000	1/2
	Maryland		6,720	2,100	1,500	300	125	10,745	4/10
	Southern N. J.		1,920	835	500	145	200	3,600	1/2
	D. C.		5,100	1,780	1,000	320	600	8,800	4/10
	Delaware		580	380	100	75	100	1,235	1/2
								$55,358	
5	Western Penna.	Allegheny County	5,100	1,200	480	200	220	7,200	4/10
		Western Penna.	4,600	1,600	1,800	1,000	1,000	10,000	3/4
	Ohio		3,600	1,500	850	1,200	1,450	8,600	3/4
		Akron	1,500	675	150	40	35	2,400	3/4
		Cuyahoga County	4,950	3,450	1,500	3,000	3,100	16,000	4/10
		Springfield	2,600	240	....	185	300	3,325	3/4
		Cincinnati	5,900	1,395	400	640	400	8,735	4/10
		Dayton	2,400	1,700	100	600	600	5,400	3/4
		Columbus	2,400	1,900	100	800	800	6,000	3/4
	West Virginia		5,500	2,200	2,400	2,000	2,900	15,000	3/4
	Michigan		16,800	4,260	12,000	540	2,400	36,000	3/4
								$118,660	
6	Tri-State								
	Virginia		5,000	1,500	1,500	1,000	1,000	10,000	3/4
		Norfolk	1,500	450	450	300	300	3,000	3/4
		Richmond	1,500	450	450	300	300	3,000	3/4
		Lynchburg	600	180	180	120	120	1,200	3/4
		Roanoke	600	180	180	120	120	1,200	3/4
		Bristol	600	180	180	120	120	1,200	3/4
	No. Carolina	Asheville	600	180	180	120	120	1,200	3/4
		Wilson	400	120	120	80	80	800	3/4
		Wilmington	300	90	90	60	60	600	3/4
		Charlotte	900	270	270	180	180	1,800	3/4
		Newbern	300	90	90	60	60	600	3/4
		Greensboro-Winston-Salem	750	225	225	150	150	1,500	3/4
		Durham-Raleigh	750	225	225	150	150	1,500	3/4
	So. Carolina	Greenville	600	180	180	120	120	1,200	3/4
		Columbia	600	180	180	120	120	1,200	3/4
		Charleston	300	90	90	60	60	600	3/4
								$30,600	

[Budget continued on page 60]

Hand Fabrication of Copper Kettles Still Flourishes in the Sugar Industry

By C. H. Thomas

THE making of a copper kettle, considered by the uninitiated as a rather primitive undertaking, has in it the old skill of hand made things, coupled with modern brains and ingenuity.

A copper kettle, such as is now used in the maple sugar business, is fashioned from different gauge sheets of copper, beginning with the flat sheet. First the edges are scalloped and sharpened, and by the use of mallets the sheets are pounded into shape to fit the bottoms and sides, using forms that are gauged for the various sizes being made.

The edges are brazed and joined for the various sized kettles. A reinforced edge or lip is formed with wire to strengthen the edges. Only a very small amount of machine work is necessary on copper kettles, many of them being huge ones for the sugar industry and allied lines.

The bottoms are dovetailed in and the edges are made smooth and rounded, because of the intense heat and the fact that contraction and expansion have to take place.

The sheets are lapped after they have been hammered to a V shape before being brazed, so that quite a few hand operations are required before the finished sugar kettle emerges into the roughened state, before being polished off and smoothed. Sulphuric acid is used in the scouring process and polishing required. The metal is the same thickness all over and from sheets $\frac{1}{16}$" to $\frac{3}{32}$" these copper kettles are made into the finished product.

The entire kettle with the exception of the handle and the two lugs that are riveted on to the sides to hold this handle looks like one piece of metal, but the fitting of the bottom circle to sides requires special skill and much time.

Some of the kettles used in the sugar industry are 30 inches in diameter and 1 to 2 feet in depth. They are hung on the end of a projection that goes into the sugar maple trees, and are used to catch the sap. In them the sap is boiled to produce maple sugar. This industry is one of the oldest and most profitable in the New England States and the methods have been handed down from father to son.

No other metal could be used as copper answers every requirement with its pliability and non-rusting qualities. The actual making of a copper kettle is something quite unique in itself, and to watch the men at their work might conjure up a picture of the old time Guilds where every workman is an expert and every thing he turned out a fine bit of workmanship. The processes are as follows in the making of a copper kettle:

1. We have the flat copper sheet.
2. End edges are sharpened to a knife point.
3. Sheets are lapped and dovetailed.
4. Brazing process is used.
5. Round up rough kettle in shop.
6. Hammering, true smooth and polishing, and attach bail for handle.

Inside and outside views of a typical sugar industry copper kettle fabricated by hand in accordance with practices as old as the art of copper smithing.

Ventilation for a Chromium Plating Plant

The collecting of fumes, odors and suspended materials from industrial processes requires skill in air handling plus an intimate knowledge of the reaction of the materials to be handled. The author of this article has long been identified with an organization which encounters these problems daily. This particular process is often encountered and is always ticklish.

By J. W. Baybutt
Instructor, Rochester Athenaeum and Mechanics Institute

AS IS well known, fumes generated from chromium plating operations are very obnoxious and dangerous to health, in addition to being a nuisance in connection with building upkeep. Consequently, special ventilation has to be provided where such fumes are liable to permeate the atmosphere.

Before the time that chromium plating began to attract real attention, the overhead hood was losing ground in favor of the edge slot type shown in accompanying sketches designated as Fig. 1, etc. One of the first ventilation trouble jobs which the writer was called upon to diagnose included overhead hoods on chromium plating tanks and these were subsequently changed to the slot type with resulting increase in efficiency.

Slot Hood

Fig. 1 and 1A illustrate the typical slot design, the hood extending over the tank as far as production conditions will allow which is usually not much. The idea is to keep down the liquid surface area exposed as much as possible, which in turn reduces the amount of air to be handled. The screen shown in Fig. 1 and 1A can be replaced with a baffle type of eliminator shown in Fig. 1B with probable increase in separation efficiency, the surface acting somewhat as a fume condensing medium. Naturally the more fumes condensed and collected as a liquid the less will be diffused to the surrounding atmosphere.

Down Draft Hood

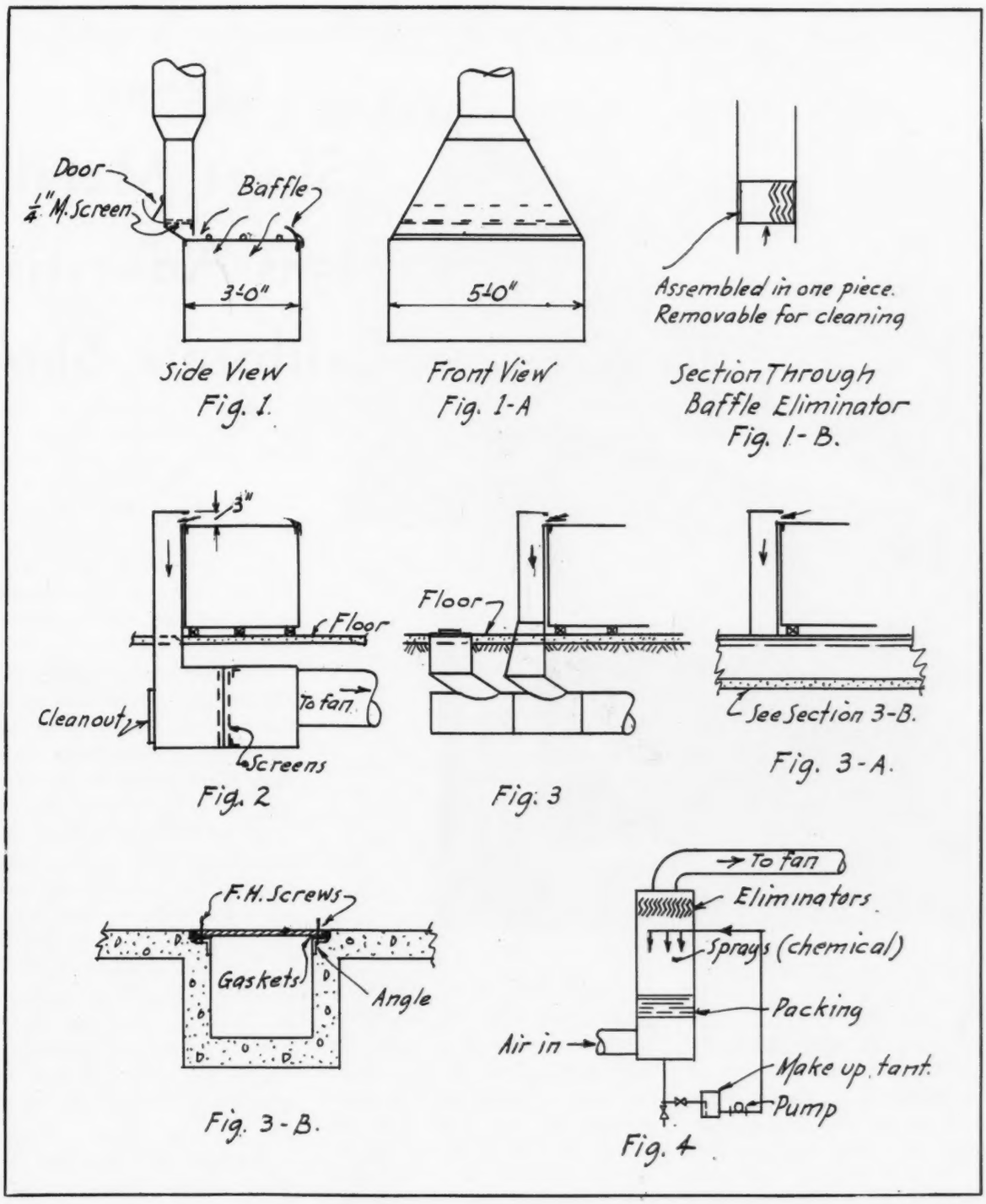
Another type of hood is shown in Fig. 2, this scheme being possible only where lower floor space is available, or underground ducts are used. The trap arrangement provides a partial condenser and separator which may be easily cleaned. In connection with the down draft type of hood the writer has resorted to numerous types of exhaust ducts. In one case vitrified tile was used below the floor as shown in Fig. 3, cleanouts and catchall provided to suit. The fan was located after and above the catchall at the end of the room.

Another idea in below floor duct work is to build a concrete chase with removable plate cover as shown in Fig. 3A and B. The fan is connected to the end of this concrete duct similar to the tile installation. The main advantage of this type of duct as against the tile is ease of cleaning. The disadvantage is the increased cost and loss of suction if the cover is not attached rigidly.

If the plating work is done in a location which demands that no fumes escape into the atmosphere a type of fume scrubbing tower as shown in Fig. 4 is sometimes used. Patented scrubbers are also on the market. In some cases the high resistance to air flow resulting in high operating costs excludes their use but they certainly do an efficient job of fume removal. Possibly we may write more about gas scrubbers in the future.

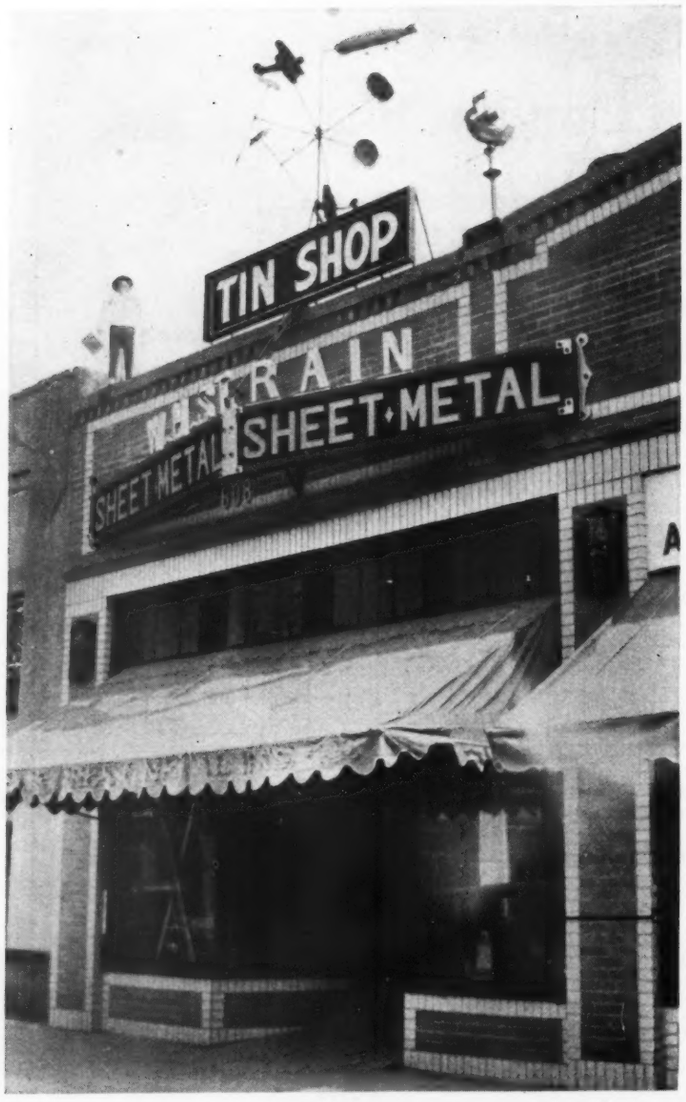
Metals

Many kinds of metals have been used in chromium fume handling duct and hoodwork, the most general one being ordinary galvanized steel, treated with a grease remover and then painted thoroughly with an acid resisting paint. The fans generally used are steel plate, overhung wheel, volume type with few blades. All the surfaces in contact with the fumes should, of course, be treated similarly to the duct work as noted above. Cleanouts should be provided amply in the duct work and also in the fan. The fan should have a drip connection with seal for cleaning.



The groups of details in the drawing above show various practical methods for handling ventilation for chromium plating tanks. One detail shows a fume scrubber which can be used whenever the discharge cannot be made directly into the outside air.

As to the amount of air to be handled the writer's rule has been to obtain the exposed liquid area and use 200 f.p.m. velocity over this area. A tank 3 feet by 5 feet having an area of 15 square feet would then require 3,000 c.f.m. to be exhausted. Preferably, this air should be taken from all sides of the tank, but production usually demands that the front shall be clear, so all of the air has to be drawn to one side. A rule sometimes followed is to make the slot opening 1 inch wide per foot of the tank width with a velocity of 2,000 f.p.m. through the slot. In case of the 3-foot tank, a 3-inch slot would be required and the exhaust required would be 2,500 c.f.m., as against the 3,000 c.f.m. noted above. The duct sizes would be designed for low pressure, this type of system usually limited to about 1½ inch static pressure except where the tower is used.



Clever Sheet Metal Signs Advertise California Shop

By
J. Edw. Tufft

A COMPOSITE weather vane that portrays the progress of transportation and a sheet metal traveling man, or "drummer," who carries a brief case and waves his arms excitedly are features of a sheet metal worker's sign in Los Angeles that often holds pedestrians for thirty minutes, according to the proprietor, W. H. Strain. The location is 610 North Western Avenue and the name of the shop is Strain's Sheet Metal Works.

The "drummer" is a very realistic fellow even if he is made of metal. He is carefully pivoted on top of the building that houses the shop and so well balanced that a five mile wind will cause him to revolve, swing his arms, show his teeth and roll his eyes. Mr. Strain spent weeks perfecting the mechanism so that the revolving of the body would cause all these things to happen. Mechanical sheet metal eyelids open and close while the mouth has a white bit of metal inside of a darker one so that when the dark one opens the white one shows giving the effect of the mouth opening and closing thus showing the teeth.

The "drummer" is life size and full bodied. He is mounted on an upright gas pipe which is bolted to the fire-wall as shown. There are ball bearings as indicated by (1) and (2) so that the man turns easily with a slight wind. This gas pipe support is not visible from the sidewalk. The dotted portions are inside the body and the cross-bar fastens at each side—figures (3) and (4).

The arms are carefully balanced and rigidly connected with a cross-bar inside the body. In one hand the "drummer" holds a flat piece of sheet metal painted to resemble a grip and in the other a sales book. These are placed at right angles to each other. When the arm holding the grip is up as it is in this sketch, any slight breeze will hurl it down and bring the other arm up and at the same time cause the whole body of the man to whirl around on the ball bearings. Any gust of wind from a slightly different angle catches the sales book and down goes that arm and up goes the other one.

The man's neck is a large limber coiled spring and the slightest breeze causes the head to sway back and forth. Behind the lips is a bit of sheet metal with some white teeth and a red tongue painted on it, the tongue painted a few inches below the teeth. This piece of metal is carefully counterbalanced by a weight. As the head nods in the breeze first the teeth and then the tongue flash into the opening between the lips and it appears as if the man were talking earnestly.

(*Continued on page* 63)

The Code—Past, Present and Future—Debated at Michigan's Convention

QUESTIONS and matters pertaining to the code for the roofing, sheet metal and furnace contracting business and ways and means of organizing for code compliance drew contractors to the 1935 annual convention of the Michigan Sheet Metal & Roofing Contractors' Association, holding their 24th annual convention March 5, 6 and 7 in Muskegon.

Questions relating to practically every phase of the industry were asked by the audience and wherever possible answered by the speakers. The convention committee, knowing in advance that such questions would be forthcoming, so organized the program that each speaker was given plenty of time for questions and answers following his discourse.

Furnace Code

"The Furnace Manufacturers' Code and Its Effect on the Independent Installer," was presented by A. W. Wrieden, Code Authority Manager, Warm Air Furnace Manufacturing Industry, Inc. Mr. Wrieden, who has been in charge of code compliance and organization for the furnace manufacturers for the past fifteen months described vividly the many problems which have confronted his organization and presented a clear and comprehensive picture of the effects of the manufacturers' code on the operations of the independent contractor.

An outline of just what the Manufacturers' Code accomplishes for the dealer was described by Mr. Wrieden as follows: "The Code clearly defines the status of jobber and installer. Every manufacturer must file a complete set of prices with the Code Authority and these price

President-Elect W. W. Busch receives scepter from Past-President John Bos.

sheets must be given to every other manufacturer and to every jobber and must be on file for constant reference. If price cuts are made, the manufacturer must publish a new price list before the price goes into effect. No jobber can sell below the manufacturer's published dealer price list. Today every dealer knows exactly what his competitor is paying for furnaces. The resale clause which states that no jobber can sell below the published price of the manufacturer is the solution for many of the ills of the independent dealer."

In answer to questions, Mr. Wrieden stated that a jobber was defined in the code as a concern which sells merchandise for resale but in no way installs, contracts or sells to the consumer. Mr. Wrieden, declared that today large dealers who formerly received a bigger discount are now objecting to the fact that they receive a discount very little beyond that of the small purchaser of furnaces.

Mail Order Sales

Mr. Wrieden declared that all mail order houses are now to be classified as installers and that any mail order store can be assessed by the Code Authority Committee in the area in which the store is located. Furthermore, branch offices of the manufacturers who sell direct are also accessible by the Code Authority in the area in which the branch office is located. The prices at which mail order houses buy are plainly published on every manufacturer's price sheet. Also, the discounts to which a large buyer is entitled, are published on this price sheet.

Mr. Wrieden made the interesting assertion that as a result of direct contact with mail order houses he has become convinced that the mail order houses do not sell on price alone. He has been convinced that mail order houses are excellent merchandisers and

The officers for 1935. From left to right—Vice-President Peter Wierenga, Grand Rapids; President W. W. Busch, Detroit; Secretary Frank Ederle, Grand Rapids.

that a large percentage of the business which they do is a direct result of better merchandising efforts rather than a result of lower prices. Mr. Wrieden stated that he had held several conferences with executives of the mail order houses and that the mail order houses are receiving just as many complaints of unfair dealer practices as the Code Authorities are receiving of unfair mail order house practices.

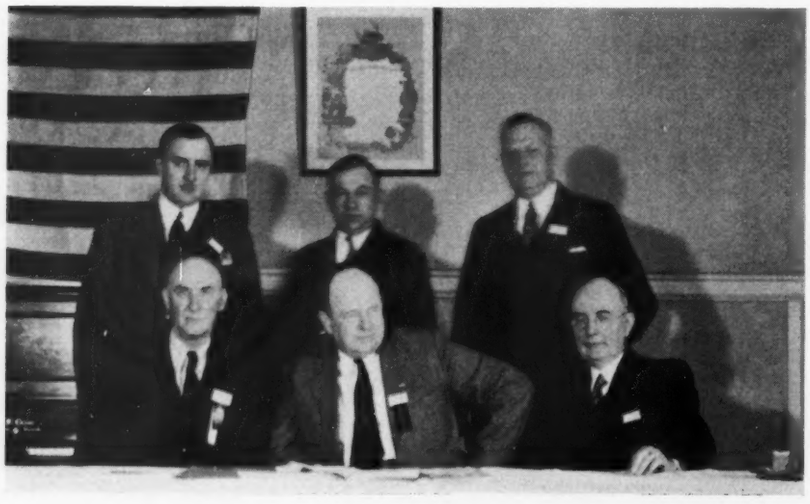
In reply to a direct question, the speaker said that due to the pressure brought to bear on manufacturers selling mail order houses, the mail order houses have now engaged in the manufacture of furnaces. Mr. Wrieden expressed the hope that the furnace industry would not engage in a price battle with the mail order houses and cited the disastrous results in the enamelware battle which has been going on among manufacturers, plumbers and the mail order houses for several months.

Mr. Wrieden described efforts which have resulted in the mail order houses increasing their catalog prices some $6.00 on an 18-inch furnace. He pointed out that the store resale price is at least 10 per cent above catalog prices and that at the published prices of manufacturers any dealer is able to buy a furnace for at least 10 per cent less than the store selling price of the mail order house.

M. O. Cooperation

Every mail order house manager is paid on the basis of a percentage of the profit, but each department manager has standing orders not to be undersold. The only salvation, in Mr. Wrieden's judgment, lies in the independent dealer and the branch mail order house getting together for the common purpose of establishing prices which will prove profitable to the entire industry.

Mr. Wrieden made known that he is attempting to convince Washington, that funds should be set aside for furnace manufacturers in order that they can keep their foundries and shops open during the off-season of the year and thus keep employment at a steady level. Mr. Wrieden, in answer to a question from the floor, stated that perhaps something of the same kind might be done for the independent dealer, possibly through a common fund of money handled by the manufacturer.



Directors for 1935. From left to right—(Seated) John Bos, Muskegon; John Clarke, Detroit; W. H. McBratnie, Saginaw; (Standing) Tom Marshall, Detroit; John F. Erherdt, Grand Rapids; Jas. Hage, Flint.

"Conditions Within the Industry," was the subject of an address by A. F. Frazee, member of the National Code Authority Committee for the furnace manufacturers. Mr. Frazee took exception to the implication made in the convention that furnace manufacturers were making a handsome profit. Mr. Frazee declared that no manufacturer, according to authentic records, has made any appreciable profit within the last several years.

Code Assessment

Taking up some of the questions which were presented from the floor, Mr. Frazee declared that in his judgment education of those contractors who did not see fit to pay the assessment and comply with the code was much to be preferred to the cracking down process which was popularized by General Johnson. The published prices of manufacturers was declared by the speaker to be one of the most progressive moves ever made by the furnace industry. Mr. Frazee expressed the personal opinion that any dealer who was able to buy furnaces in quantity lots was certainly entitled to a larger discount than the contractor who was able to buy one at a time or in very small lots. He qualified this statement by declaring that this additional discount should in no case be as large as the discount seemingly anticipated by some of the contractors present at the convention.

Mr. Frazee cited some of his experiences with mail order house executives and declared that merchandising was responsible for at least 90 per cent of the sales made by the mail order houses. "Investigation has disclosed," declared Mr. Frazee, "that only 10 per cent of the furnaces sold by mail order houses are sold from the catalog. The other 90 per cent are sold from the branch stores."

"The need for city ordinances which control the installation of furnaces and insure that all installations are made according to the Standard Code" was declared

(*Continued on page* 59)

ok excep-
made in
urnace
aking a
Frazee
facturer,
records,
le profit
ears.

t

ne ques-
ed from
declared
lucation
did not
ent and
s much
racking
popu-
n. The
facturer-
speaker
ressive
urnace
pressed
t any
y fur-
s cer-
larger
r who
ime or
alified
g that
uld in
e dis-
d by
resent

f his
house
mer-
or at
made
"In-
de-
y 10
d by
from
per
anch

nces
n of
in-
g to
ared

Air Conditioning Section

Devoted to the technical and merchandising problems of air conditioning in homes and small buildings

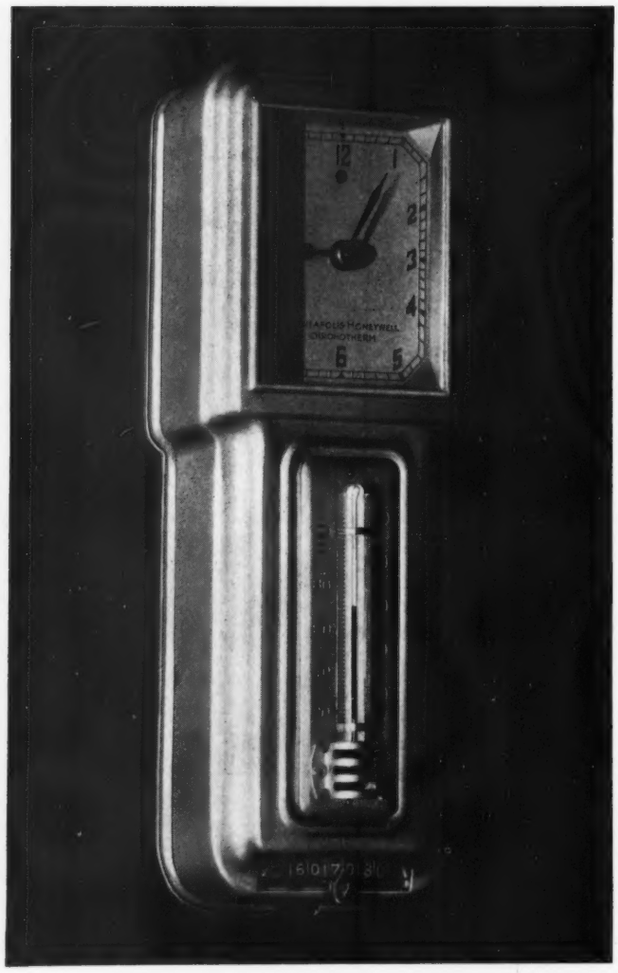
WE would like to call readers' attention to the article in this issue covering the use of a nomograph chart for working out the Mechanical Code.

- - - We have tried out this chart method on two plans and find it works very well—saves some time; eliminates forgetfulness on some of the code tables; and presents for rapid solution the successive steps which should be followed in working the code.

- - - The chart was supplied to us for reproduction in somewhat larger size. If you try the chart and find it is on too small a scale, ask us about the enlarged copy.

- - - Readers should remember that the chart does not replace the code—rather it makes the calculations easier and faster. Follow the author's typical problem as a guide.

THEY WON'T KNOW . . . . UNTIL YOU Show Them



YOUR customers will never know the advantages of modern automatic controls until you show them. They won't realize that the improvements in the last few years will greatly increase their comfort and eliminate all attention, and at the same time effect economies that will pay for these modern controls, often in a short time. Capitalize on these modern controls. Replace worn and out of date equipment with modern controls which will give greater satisfaction with automatic heat. Show your customers the advantages of limit controls, summer-winter controls, the low water cutoff and the Chronotherm. Standardize on Minneapolis-Honeywell's complete line of controls for modernization to insure satisfaction and undivided responsibility. These controls can be paid for under the terms of the Better Housing Program. Minneapolis-Honeywell Regulartor Company, 2726 Fourth Avenue South, Minneapolis, Minnesota . . .

▪ Quality Controls Costs Less Than Service ▪

MINNEAPOLIS-HONEYWELL

Control Systems

"HERE'S MY IDEA OF A REAL WINTER AIR CONDITIONING UNIT!"

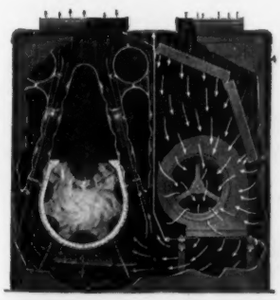
"Anyone can see that plenty of careful thought and sound engineering have gone into the building of Delco-Heat Conditionair. It's made by Delco Appliance Corporation, a General Motors' subsidiary. They've had years of experience in building quality electrical and mechanical appliances. Every mechanical feature has been checked and approved by warm air heating specialists. Delco-Heat engineers installed units in homes near the factory so they could watch them in operation under actual home conditions and prove their efficiency. This took a lot of time and money but when Delco-Heat Conditionair was offered to the public it was right!"

★ ★ ★

We realize fully what vitally important part warm air heating and sheet metal contractors and dealers play in the merchandising and installing of Delco-Heat Conditionair. As its makers, we welcome every opportunity to offer our fullest cooperation.

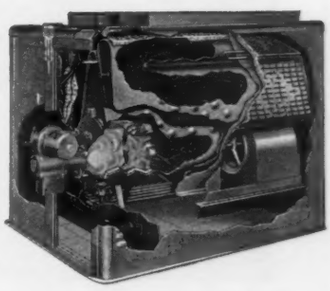
Complete facts and specifications on this completely harmonized heating and winter air conditioning unit will be sent without cost or obligation to contractors and dealers.

Simply mail the coupon.



● *Cross-sectional view shows the direction which the air takes in passing through filters and blowers; thence to humidifier and stream-lined heat transfer unit. Streamline construction reduces resistance to air flow. Projectors transfer maximum heat. Combustion chamber refractory liberates stored heat after burner ceases operating. Result—greater heating economy.*

● *In the Delco-Heat Conditionair are four filters which contain specially treated strands of blown glass covered with an adhesive material. The incoming air must first pass through these filters where dust, dirt, pollen and bacteria are removed; then large capacity centrifugal blowers, operating quietly, circulate this purified, freshened air.*



DELCO-HEAT *Conditionair*

A PRODUCT OF GENERAL MOTORS

A complete line of automatic oil heating equipment for domestic and commercial applications.

DELCO APPLIANCE CORPORATION

Subsidiary of General Motors ● Dept. 13-M, Rochester, N. Y.

Send facts about Delco-Heat Conditionair.

Please check business:

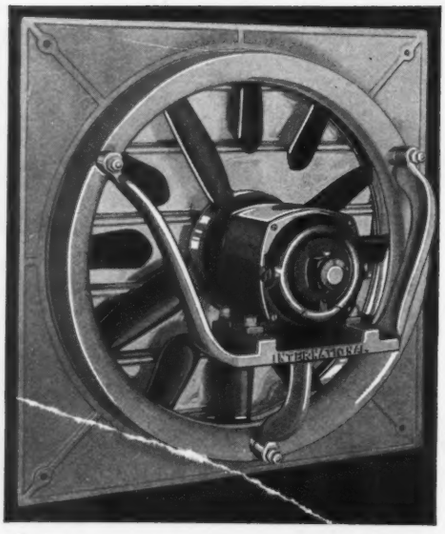
☐ *Warm air heating contractor and dealer* ☐ *Sheet metal contractor* ☐ *Air conditioning dealer*

Name _____

Address _____

_____

SPRING starts AIR CONDITIONING get your share of it.. SELL



INTERNATIONAL AIR-COOLING SYSTEMS

International places Air Cooling within the reach of all purses . . . removes it from the luxury class, and stamps it definitely as a modern necessity. When you explain to your prospect the many advantages and comforts derived by air cooling his home, and then tell him how little it costs, it always results in another International Air Cooling sale.

Now is the time to start! March, April and May will be banner sales months for air conditioning equipment. The volume of your sales will be determined by the lines you handle. Make certain of Air Cooling business . . . handle International, the finest you can secure, and, despite the low price, a nice margin of profit for you.

SEND FOR SALES MANUAL 30 . . .

A 16 page book giving complete information regarding International Domestic and Industrial Air Cooling Systems, as well as sales suggestions, and list of advertising material available.

ALSO, INTERNATIONAL FANS FOR INDUSTRIAL VENTILATION

SEE SALES MANUAL FOR HELPFUL SUGGESTIONS

INTERNATIONAL ENGINEERING, Inc.

15 PARK ROW, N. Y.

DAYTON OHIO

DEPENDABLE ELECTRIC ACCESSORIES BUILD YOUR PROFITS

The RIGHT MOTOR for FANS and BLOWERS QUIET . . . CARE-FREE . . . EASILY INSTALLED

For belt-driven fans and blowers requiring up to 1/4 hp., you can't go wrong if you select the G-E Type KH split-phase motor (illustrated).

It's dependable. It's easily installed because of its simplified, built-in terminal box, and because of its slotted base, which reduces the adjustment of belt tension almost to a matter of seconds. Add to these a lubrication system that provides *once-a-season* oiling, drip-proof end flanges that keep maintenance *down* by keeping undesirable materials *out*, and cushioned-power rubber mounting, and you have an equipment "buy" that's built to last.

NEW, electrically operated VALVE SMALL . . . COMPACT . . . LOW-PRICED

Ideally suited to air-conditioning needs, this new electric valve will handle water or low-pressure steam quickly, easily, and economically, by remote control.

It provides positive operation over a wide range of pressures and temperatures. It is economical—it uses only 7 1/2 watts at 110 volts, 60 cycles. Its parts are sealed in steel —no stuffing box. A handy, built-in terminal box saves installation expense. A convenient metering pin provides 50-per-cent-flow regulation —no extra valve is needed.

If you have a large task for a little valve, this valve will save you money.

GENERAL ELECTRIC
MOTOR STARTING SWITCH
CR1061-A5A CAT. 4388855
ON
AFTER OVERLOAD TURN KNOB TO OFF THEN TO ON
OFF
MAX. MOTOR RATINGS 3/4 HP. 110-220 V. A.C. SINGLE-PHASE
CAUTION: BEFORE INSTALLING OR OPERATING READ INST. GEI-405
SCHENECTADY, N.Y., U.S.A.

A NEW STARTING SWITCH . . . Inexpensive . . . Compact . . . Provides positive protection

This new, small, motor-starting switch meets the demand for positive overload protection for fractional-horsepower motors.

Housed in a strong, steel case with an attractive aluminum face plate, it is easily installed—convenient conduit knockouts in top and bottom. It is equipped with unusually large, pure-silver contacts—an assurance of long life and trouble-free service. It has a snap action—prevents slow opening or closing, and also prevents burning of contacts.

Your name on the coupon is a good investment!

To maintain and protect your reputation for service and dependability, it will always pay you to insist on the highest quality when buying electric equipment. For quality and correctness of design, order General Electric wire and wiring devices along with your motors, control, etc.

GENERAL ELECTRIC

General Electric Company, Dept. 6 E-201, Schenectady, N. Y.

Please send me the following publications, as checked:

☐ GEA-1276A, Type KH motors

☐ GEA-1761, NEW starting switches for small motors

☐ GEA-1847A, Solenoid Valves

☐ Also, please place me on your list

to receive information covering small motors for air-conditioning applications.

Name.....

Firm.....

Street..... *City*..... *State*.....

070-50

It is LOGICAL

. . . that the American Radiator Company should offer an air filter to the Heating, Piping and Air Conditioning Industries...

●

. . . that the American Radiator Company should offer an air filter that is an engineered product built on scientific principles...

●

. . . that it has been thoroughly tested in laboratory and in the field, and has already been adopted as standard equipment by many manufacturers of Air Conditioning apparatus.

Engineered cellular passages and 90° change in direction of air flow give Arco Air Filters their uniformity and efficiency.

ARCO AIR FILTERS

are made in special types for air conditioning units, fan furnaces, commercial and ventilating installations. They have these distinctive features:

- Light — inexpensive — throw-away type.
- Odorless — Nonflammable.
- Viscous coated — saturated — will not drip oil at 180°.
- No dry dust can pass through filter into air stream.
- Cellular type — providing 90° change in air flow.
- Area — depth — and angle of every cellular passage exactly the same, resulting in uniform resistance and efficiency in EVERY SQUARE INCH of surface on each individual filter, and THE SAME resistance and efficiency in all filters of the same type.
- Resistance builds up slowly and uniformly, insuring large dust-carrying capacity.

NRA CODE

INDUSTRIAL DIVISION

AMERICAN RADIATOR COMPANY

40 West 40th Street, New York, N. Y.

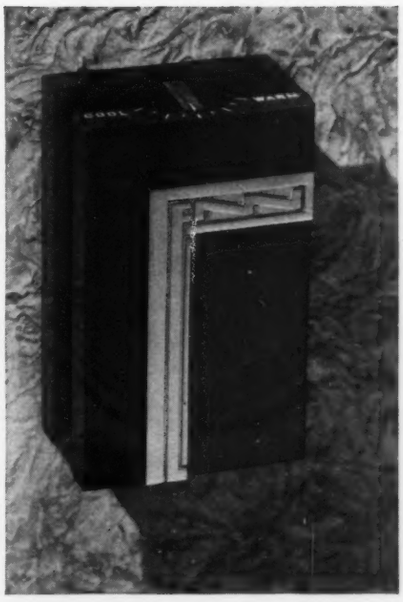
Division of AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

Approved ★

Nearly one year ago . . when the New Penn Temtrol System was generally announced . . we issued the following statement:

"Any automatic heating plant sold this season with a conventional thermostat, plain or clock type, will be sold with an obsolete control. And you can depend upon it that some alert dealer will replace that thermostat with Temtrol almost at once. This is a plain statement of fact . . not a claim for advertising effect. Temtrol has superseded the thermostat."

Today the truth of that statement is being proved by the ever increasing number of Temtrols sold to replace obsolete, conventional thermostats . . and by the leadership which Temtrol has achieved in the field of automatic temperature control.



★

Temtrol has been both proved and approved by many of the largest and best known manufacturers in the automatic heating industry in their own testing laboratories and by service in the field. To maintain your prestige and leadership, insist that every installation you make or service be controlled by Temtrol.

RE-CONTROL WITH TEMTROL

The replacement market of obsolete thermostats offers every automatic heating dealer a real opportunity to materially improve the comfort and satisfaction of his clients' heating systems, and to increase sales and profits. Write today for complete details and the special offers included in the Penn "RE-control with Temtrol" Campaign, a splendid selling idea which creates business for every type of home appliance, heating, and air-conditioning equipment you sell. Sales aids include a new type Temtrol Home Operating Demonstrator and Demonstration Boards for salesmen, a complete local advertising campaign, and attractive sales literature.

DEMONSTRATOR
At Special Prices

Dealers from coast to coast have ordered these attractive new Temtrol Display Demonstrators and report they create wonderful sales. Standard equipment now includes beautiful new ivory model Temtrols and Timetrol at no extra cost. Complete kit including carrying case priced less than cost of controls. Send for complete details and prices.

PENN
ELECTRIC SWITCH CO.

GENERAL OFFICES . . DES MOINES, IOWA. **BRANCHES:** New York, Boston, Detroit, Chicago. **REPRESENTATIVES:** Minneapolis, San Francisco, Los Angeles, Seattle, Kansas City. **DISTRIBUTORS** in Most Principal Cities. **EXPORT OFFICE:** 15 Laight St., New York City.

Forced Air Heating Facts From The Research Residence

By S. Konzo

This article, which is the fourth of the series, and succeeding articles on the forced-air heating research carried on at the Warm Air Research Residence in Urbana, Illinois, are based to a large extent on the material published in Bulletin 266 of the Engineering Experiment Station of the University of Illinois. The author has also drawn on additional sources for these discussions.

Air Temperatures and Room Temperature Gradients

Introduction

Above all things, the home-owner demands comfort. He demands a livable and comfortable environment in his living quarters, and not necessarily *the maintenance of a certain arbitrary temperature at a certain arbitrary level above the floor.*

The latter stipulation is introduced by the installer of the heating equipment, who has found through previous experience that when an air temperature of say 72 deg. F. is maintained at the breathing level (5 feet above the floor), the operation of the heating plant is regarded as reasonably satisfactory in the majority of cases. This stipulation of a 72-degree air temperature at the breathing level can only be regarded as a good approximation, since ultimately the performance of the plant will be judged in terms of the question: "Is the owner comfortable?"

It is the purpose of this article to discuss some of the factors affecting room temperatures, and particularly those factors affecting the room air temperatures in the living zone, below the breathing level.

Room Temperatures in a Gravity System

The procedure involved in the design and installation of a heating plant for any given structure can very logically be divided into three fundamental steps. In the first place, the calculations of heat losses, pipe sizes, and furnace size are made for the sole purpose of installing a heating plant which will supply enough heat to maintain a breathing level temperature of say 72 deg. F. for the most extreme weather condition.

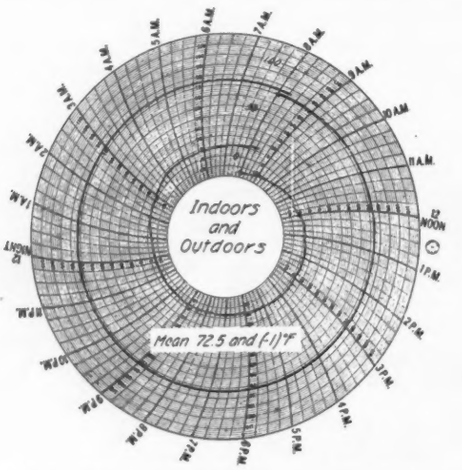


Fig. 1—Indoor and outdoor temperature record for gravity heating system under excellent automatic control.

Secondly, with this assurance that the plant is large enough to handle even the most severe heating load placed upon it, the installer proceeds to install automatic controls and regulatory devices to maintain this temperature of 72 deg. F. in the house under all weather conditions. Fig. 1 shows a temperature record for indoor and outdoor temperatures for a well designed and excellently controlled gravity warm-air heating system. It may be noted that the breathing level temperature in the Dining Room of the Research Residence, from which this record was taken, was uniformly maintained at a mean temperature of 72.5 deg. F. even when the outdoor air temperature varied from plus 13 deg. F. to minus 15 deg. F.

Obviously, the third step is the maintenance of this uniform room temperature condition, not only in the room in which the room thermostat is located, but also in all of the other rooms of the house. In the case of a gravity, warm-air heating system the installation is regarded as reasonably satisfactory if the air temperatures in all of the different rooms in a house are within the limits of approximately 69 to 76 degrees F. at any given time. Where the house is small and compact in design, and the length of the leaders is not excessive, it is possible to install gravity heating systems which with proper automatic control devices will produce room temperatures within the limits stated. In the case of hand controlled plants, however, larger variations in temperatures of the rooms may be expected.

Room Temperatures in a Forced-Air System

In the case of larger houses, and especially those covering considerable ground area, forced-air systems are better adapted for heating purposes than are gravity warm-air systems. The temperature regulation within any given room for such forced-air systems is decidedly dependent upon the sensitivity of the automatic control system used. *In general, however, a closer regulation of room temperatures may be expected with a forced-air system than with a gravity heating system.*

Usually, satisfactory temperature control is regarded as that in which the temperature of the control room does not deviate by more than approximately 1½ to 2 degrees from the mean temperature. In other words, the thermostatic control should be of such sensitivity that the temperature of the control room does not exceed 73.5 deg. F. nor fall below 70.5 deg. F. when a mean temperature of 72 deg. F. is desired. In

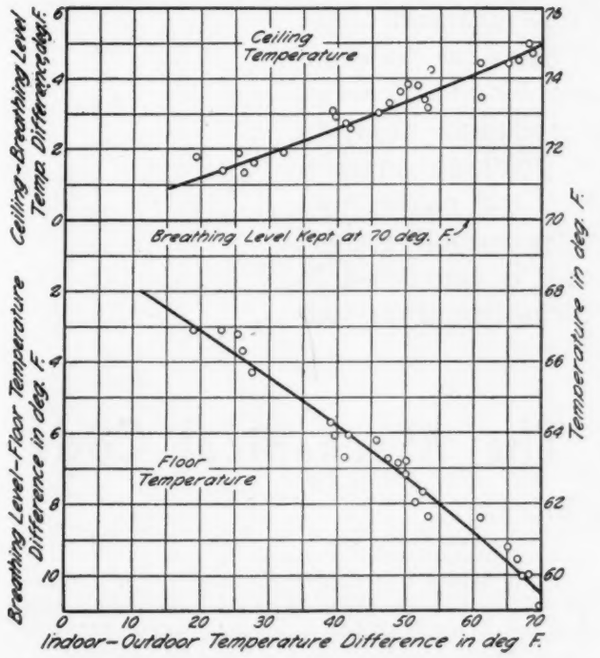

Ceiling Temperature
Breathing Level Kept at 70 deg. F.
Floor Temperature
Ceiling-Breathing Level Temp. Difference in deg. F.
Breathing Level-Floor Temperature Difference in deg. F.
Temperature in deg. F.
Indoor-Outdoor Temperature Difference in deg. F.

Fig. 2—Room temperature gradients for varying outdoor temperatures. Note how the variance gets greater as outdoor temperatures get colder.

addition, the temperature in any one room should not deviate by more than approximately 2 deg. from the mean temperature of the house, after the duct system has been balanced for proper heat distribution.

In the Research Residence forced-air plant it was found that after the dampers were installed and adjusted, the plant was brought into balance with all room temperatures within approximately 1.0 deg. of 71.0 deg. F., with the exception of the sun-room and the west dormitory, which were within 2.0 deg.

With intermittent operation of the fan under conditions of normal heating demand on the house, it was found that a frequency of "fan on" cycles of between four to eight times per hour gave satisfactory performance. Higher frequencies would tend to give closer regulation of the room temperatures, but the numerous starting-up periods might be detrimental to the fan and motor equipment. On the other hand, frequencies of less than four times per hour in normal heating weather would not give satisfactory regulation and equalization of room temperatures.

Temperature Gradients in Room

The discussion up to this point has been with reference to air temperatures maintained at the breathing level and has not been concerned with the temperatures below the breathing level in the "living zone."

Heated air in a room tends to rise, and is replaced by cooler air. The air temperature at the ceiling is higher than that at the breathing level (5 feet above the floor), and as a result the heat loss from the upper portion of the room is greater than the heat loss which would occur if no temperature gradient existed. Moreover, the cool air in the living zone (below the 5-foot level) adds to the discomfort of the occupant. Any great temperature difference from the breathing level to the floor is undesirable.

Fig. 2 shows a typical temperature gradient for a heated room. Three conditions are clearly indicated in the figure:

1. The breathing level temperature is maintained at 70 deg. F. for all weather conditions.
2. The ceiling temperature increases as the difference in temperature between indoors and outdoors becomes greater.
3. The temperature of the air near the floor decreases as the weather gets colder.

For instance, when the outdoor air temperature is 30 deg. F. (the temperature difference between indoors and outdoors is 40 deg. F.) the ceiling temperature is 72.6 deg. F. and the floor temperature is 64.3 deg. F. For zero degree outdoor weather (temperature difference of 70 deg. F.) the ceiling temperature is 75.0 deg. F. and the floor temperature is 59.5 deg. F.

Factors Affecting Temperature Gradient

Of the many factors that affect the temperature gradient in a heated room, the following are of importance:

1. External weather conditions.
2. Nature of room construction.
3. Type of heating system.
4. Temperature of air entering room.
5. Return air grilles.
6. Warm air supply registers.

The discussion that follows will consider in greater detail the influence of each of the factors enumerated.

Effect of Weather Conditions

As indicated in Fig. 2 the difference in air temperatures between the ceiling and the floor is directly dependent on the outdoor temperature; the colder the weather that prevails, the greater is the difference that exists. Since this is the case, any comparisons of the temperature gradients established with different methods of operation should be based on the same outdoor weather conditions, or the comparisons will not be valid.

Even with the same outdoor air temperature, the gradients will also be affected to some extent by the intensity and direction of the wind and the intensity of the sun shining through the windows. High winds tend to increase the inleakage of cold air through the cracks into the room, and also tend to reduce the inside wall surface temperatures. Both of these factors tend to create cooler floor temperatures. The effect of sun shining through windows is to raise the floor

(*Text continued on page* 40)

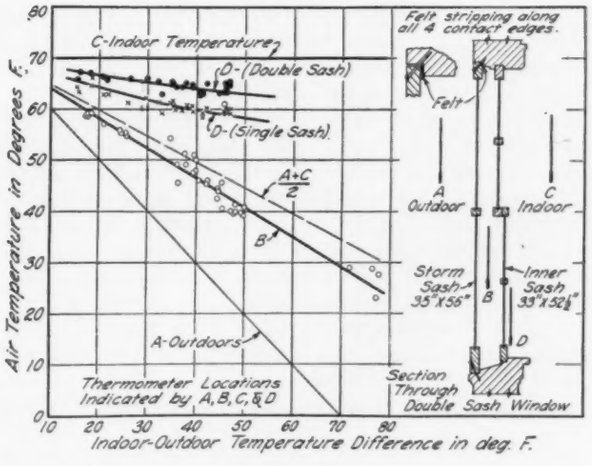


Fig. 3—Air temperatures outside, between and near windows tightly storm-sashed.

The practical contractor's Mechanical Code slide rule might well be the name for the alignment chart presented here by Mr. Kroeker. This chart, by the simple procedure of laying a straightedge from one point to another, eliminates the multiplication and paper work required by the code. Furthermore, the chart is so designed that the user is compelled to follow through with the successive steps suggested by the code.

An Alignment Chart For The Mechanical Code

By J. Donald Kroeker

ALL calculations, beginning with room basic factors, which are required to be made in designing a mechanical warm air heating system according to the third edition of "The Code for the Installation of Mechanical Warm Air Furnace Heating Systems in Residences," prepared and published by the National Warm Air Heating and Air Conditioning Association, can be made simply and quickly on the accompanying alignment chart, without making a single long hand multiplication or division. The only calculation not covered is the design of the trunk line in such a system according to this code, which is a simple matter of addition of areas of the various branches with standardized and specified adjustments.

The various scales represented on the chart are each captioned, so that both the quantity and the unit in which it is given are found at a glance. Thus scale 1 shows, at the left, the difference between room temperature and register air temperature in degrees F. and, at the right, register air temperature in the same unit, but based on a room temperature of 65 degrees, according to the code.

Scale 2 reads room basic factors directly or heat loss in 1,000 B.t.u. per hour. Scale 3 is air volume in cubic feet per minute of standard air (70 degrees F. at standard sea level atmospheric pressure of 29.92 inches of equivalent mercury column).

An Example

To start with, let us say we have decided upon the register air temperature which we plan to use and have determined the room basic factors for the various rooms in question. Then on scale 1, we find the register air temperature to be used and place a pencil point on the scale at that value, then place our straight edge (a transparent triangle is the ideal and usually available straight edge) against our pencil point and move the right end of it up to the intersection on scale 2 of the proper value for room basic factor. We can now read the air volume required at the point where our straight edge intersects scale 3.

The example shown in the chart begins with a register temperature of 140 degrees and a room basic factor of 9, the air volume found being 111 c.f.m.

Scale 4, located at the extreme right, carries values of velocity, for standard air at the right and for heated air (used as average by the mechanical code) at the left.

Let us say that we are planning to use a velocity of 600 f.p.m. in the branches and that we want to know the size of round pipe required to carry 111 c.f.m. Holding the value we had on scale 3, we slide our straight edge to the right and raise the right end until it intersects the left side of scale 4 at 600, the velocity to be used. Then we read the size of pipe to be used directly at the left side of scale 5; namely, about 6.2 inches, so we would use a pipe having a diameter of 6½ or 7 inches. If, however, we wanted to use a duct of rectangular cross-section, which would have the same resistance to air flow as the round pipe of the required diameter, we would use scales 6 and 7.

To do so, we hold the point obtained on scale 5, and, using this point as a pivot, move our straight edge so that the right end of it intersects scale 6 at the depth in inches that we want to make the duct. The left end of the straight edge will then intersect scale 7 at the required width. In the example shown on the chart, a depth of 4 inches is used, which gives a width slightly greater than 8 inches, so we would normally use an 8¼ or 8½-inch width in this duct.

Let us say, further, that this pipe leads to a stack 3 inches in depth, and that we want to know the width we should use. Holding the same point on scale 5 which we had above, we move the right end of the straight edge down to 3 inches on scale 6 and read the width on scale 7; namely, 11½ inches. So we would probably use a 3x12 riser.

To find the register area, we use only scales 3, 4, and 5. Assume we plan to use a register velocity of 300 f.p.m. We start at scale 3 as above, with 111 c.f.m. and move the right end of the straight edge up to the velocity in warm air, found at the left of scale 4, to 300, and read the intercept at the right of scale 5; namely, 60 square inches, the net free area of the register.

To find the size of the cold air return, we proceed exactly as above in getting the size of warm air supply pipe, except that in this case the right hand scale of scale 4 must be used.

Codifying the above procedure, we align in the order in which the scales are numbered, using the left hand scale of 4 when designing the supply system and the right hand scale on 4 when designing the return system.

(*Continued on page* 45)

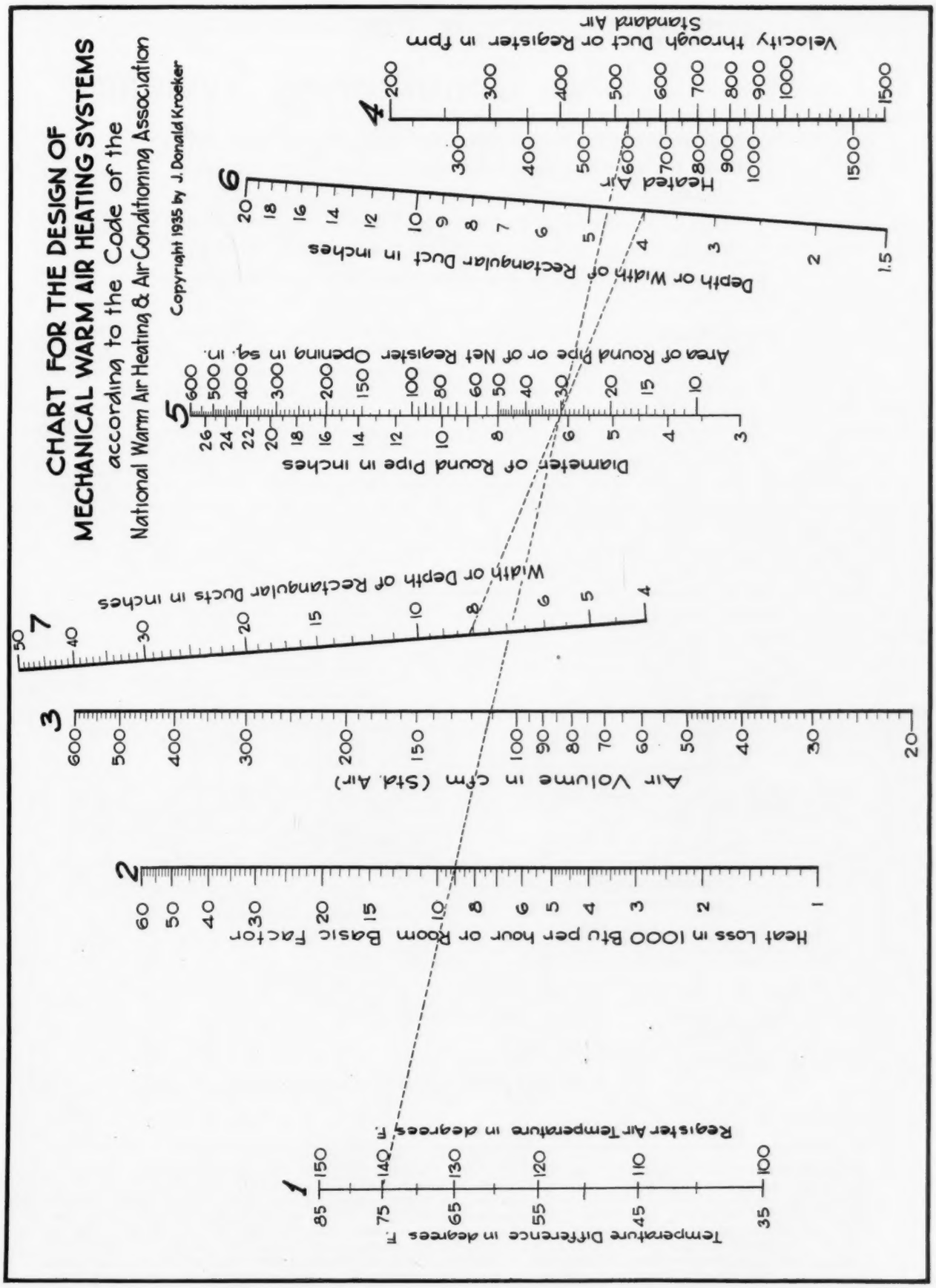


CHART FOR THE DESIGN OF MECHANICAL WARM AIR HEATING SYSTEMS
according to the Code of the National Warm Air Heating & Air Conditioning Association
Copyright 1935 by J. Donald Kroeker
Register Air Temperature in degrees F.
Temperature Difference in degrees F.
Heat Loss in 1000 Btu per hour or Room Basic Factor
Air Volume in cfm (Std. Air)
Width or Depth of Rectangular Ducts in inches
Diameter of Round Pipe in inches
Area of Round Pipe or of Net Register Opening in sq. in.
Depth or Width of Rectangular Duct in inches
Heated Air
Velocity through Duct or Register in fpm
Standard Air

We have tried to present Mr. Kroeker's chart in large enough size so that readers can work right from the page. However, if you do not find the chart large enough and want a larger scale copy, write us. Arrangements will be attempted so that a larger scale chart can be furnished.

Automatic Controls For Air Conditioning Systems

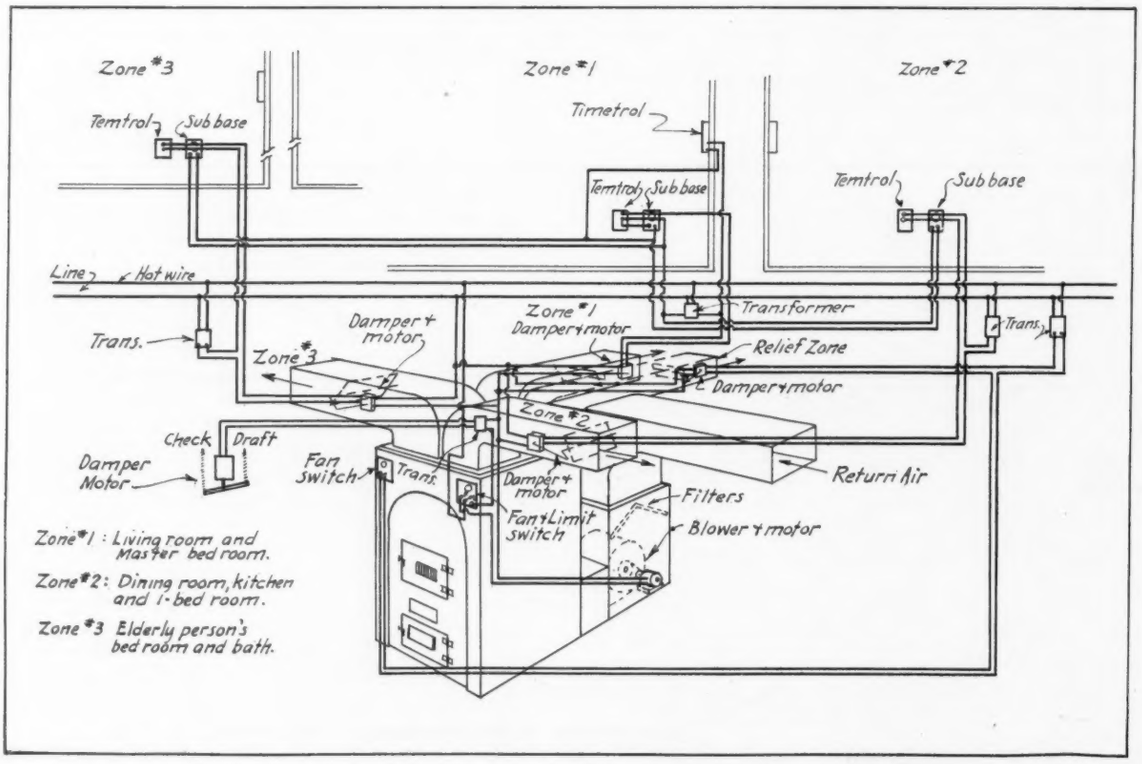
Our automatic control article in the February issue outlined the general characteristics of the three popular variations of zone control and operation. This article takes up the three systems in detail and covers variation one and two. Wiring diagrams show typical arrangements of apparatus and their electrical connection.

System Number 1

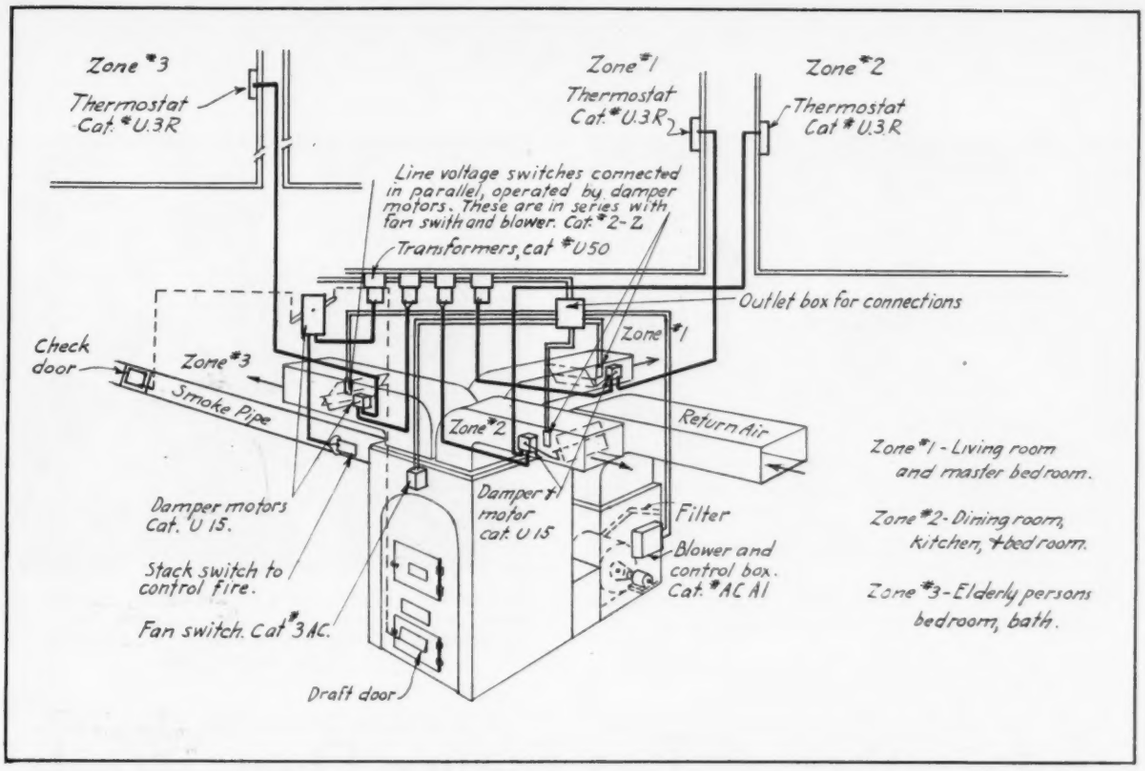
The operating cycle of system number 1 can be briefly outlined as follows. We have no relief zone. Let us say one zone calls for heat. The zone thermostat causes the zone damper to open; causes the furnace draft door to open; causes the fan to start. In this cycle our low limit fan control plays an important part. The fan can run if the bonnet air temperature is up to the "fan run" temperature, but cannot run if bonnet air temperature is too low. Should bonnet air temperature get too high, due to prolonged fire acceleration, our "high limit" fire control shuts the furnace draft even though some zone is calling for heat. Should bonnet air temperatures get too high after all zones are satisfied our fan cannot run so the furnace suffers.

If we read the specifications of system number 1 again we immediately sense the fact that this plan requires a good balance between all the factors and functions involved. For instance, our fire coasts along during the time all thermostats are satisfied, but just as soon as one zone needs heat our draft opens and the fan starts (or should). And on the reverse cycle our fire has been accelerating until

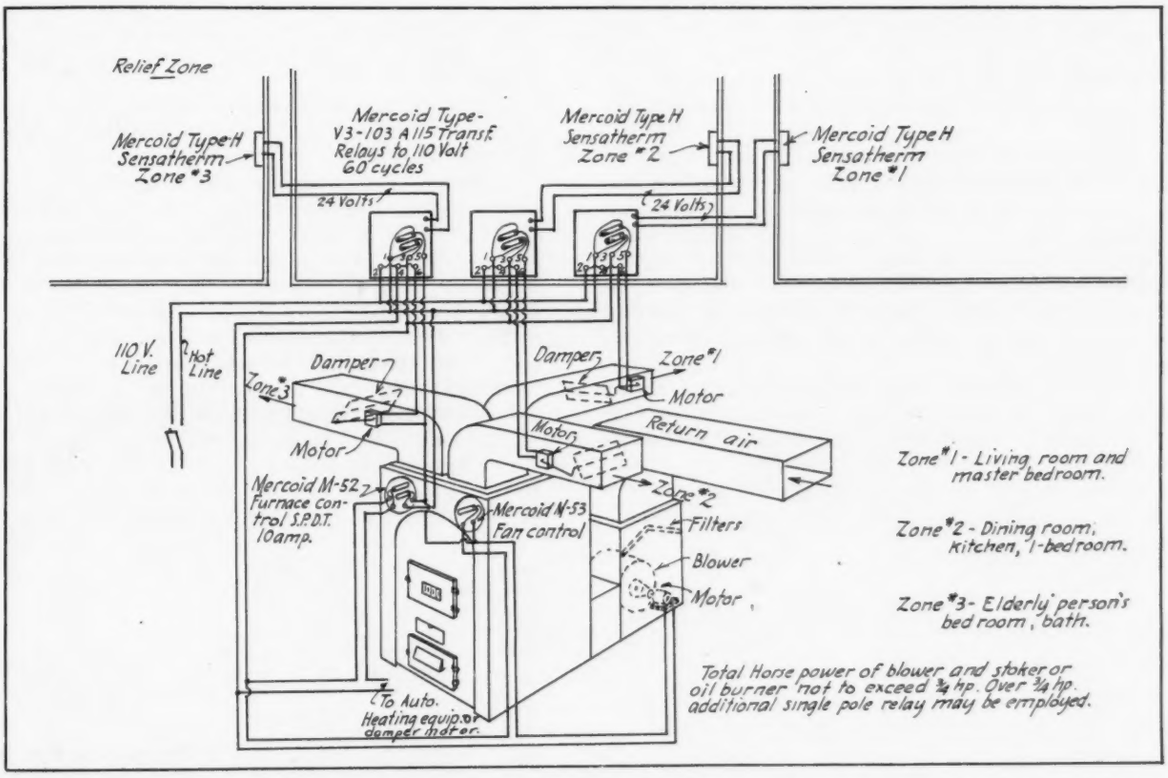
(*Text continued on page* 47)



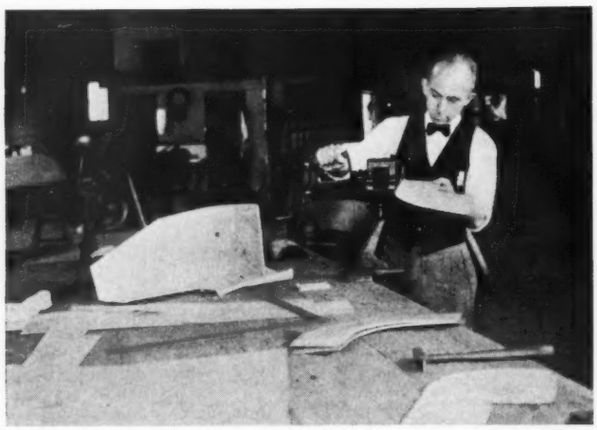
The hook-up shown above is similar to system No. 2. Each Temtrol controls its zone damper auxiliary switches in the damper, motors operate the draft motor and start the blower providing the bonnet temperature is above the temperature selected as feeling "chilly" at the registers. In normal operation, the draft remains open and the blower runs as long as any one of the Temtrols is calling for heat. If the bonnet temperature drops too low while one or more of the zones is calling for heat, the blower will stop, but the draft will remain open and the proper temperature is soon restored. In case an excessive temperature is reached in the bonnet, the limit switch opens allowing the draft to close and the check to open but does not interfere with the operation of the zone dampers and the blower. The system shown incorporates a separate fan switch which closes at the temperature that is considered dangerous, opens the relief zone damper, and starts the blower. This relief system is fully automatic and cuts off as soon as the dangerously high temperature is relieved. A system of night temperature set-back which gives the home owner a choice of either 6° or 9° temperature drop is accomplished with one master Timetrol. Penn Electric Switch Co. apparatus.


Zone #3
Thermostat Cat. #U.3R
Zone #1
Thermostat Cat. #U.3R
Zone #2
Thermostat Cat #U.3R
Line voltage switches connected in parallel, operated by damper motors. These are in series with fan swith and blower. Cat. #2-Z.
Transformers, cat #U50
Outlet box for connections
Check door
Zone #3
Smoke Pipe
Zone #1
Zone #2
Return Air
Damper motors Cat. U 15.
Damper motor cat. U 15
Filter
Blower and control box. Cat. #AC A1
Stack switch to control fire.
Fan switch. Cat #3AC.
Draft door
Zone #1 - Living room and master bedroom.
Zone #2 - Dining room, kitchen, 1 bedroom.
Zone #3 - Elderly persons bedroom, bath.

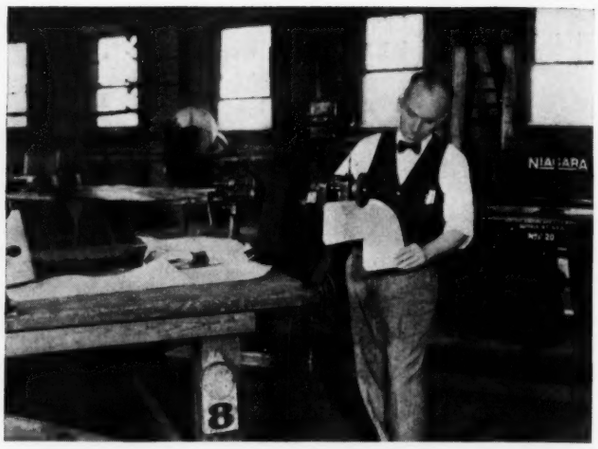
The wiring system shown above—showing Russell Electric Company apparatus employs a floating control of combustion. By this means, it is necessary for the fan to take heat from the bonnet, thereby cooling the stack gases which then turn on the draft by means of the stack switch and damper motor. The damper motors, operating the duct dampers, also operate line voltage switches, so that if any duct is open, the fan will operate provided there is heat in the bonnet as determined by the bonnet switch. With this system of control, the bonnet temperatures can never reach a dangerous value, and furnace efficiency is a maximum because of perfect control of combustion.


Relief Zone
Mercoid Type H Sensatherm Zone #3
Mercoid Type-V3-103 A 115 Transf. Relays to 110 Volt 60 cycles
Mercoid Type H Sensatherm Zone #2
Mercoid Type H Sensatherm Zone #1
24 Volts
24 Volts
110 V. Line
Hot Line
Damper
Zone #3
Motor
Damper
Zone #1
Motor
Motor
Return air
Zone #2
Mercoid M-52 Furnace control S.P.D.T. 10 amp.
Mercoid M-53 Fan control
Filters
Blower
Motor
To Auto. Heating equip. or damper motor.
Zone #1 - Living room and master bedroom.
Zone #2 - Dining room, kitchen, 1-bedroom.
Zone #3 - Elderly person's bed room, bath.
Total Horse power of blower and stoker or oil burner not to exceed ¾ hp. Over ¾ hp. additional single pole relay may be employed.

The wiring diagram above shows an arrangement of Mercoid controls for zone control system No. 2. Zone No. 3 has been selected for our relief zone. Since zone No. 3 is supposedly an elderly person's bedroom and bath an overshoot in temperature would not be harmful should the relief zone damper be opened by the high limit control. The operation of this system briefly is as follows: 1. Any thermostat calling for heat opens its zone damper and starts the automatic burner and puts the fan motor in circuit. 2. "Low limit" fan control, M-53, starts the blower when the bonnet temperature reaches the desired degree. 3. Any satisfied thermostat will close its zone damper. If all thermostats are satisfied the automatic burner and blower will shut off. 4. Should the bonnet temperature become dangerously high, "high limit" will shut down automatic heating equipment and open the relief zone damper and start the blower. Since Mercoid controls are designed for simple two wire systems color to color wiring is not necessary.



One-eighth of an inch was turned on all fitting edges in the elbow edging machine as shown here. Heels and throats were given a double fold in the same machine.



The corrugated edge made by the edging machine was flattened out by running the piece through the machine as shown here. Then a mallet and flat iron was used to give the finished fold.

Fabrication of Test House Duct Work

By Platte Overton

CONSIDERABLE interest has been shown in the sheet metal work in connection with the American Artisan Test House. We believe this sheet metal work to be of some importance and the following brief outline might be entitled "A plea for neat metal work."

In laying out the duct work in the test house the usual procedure was followed. The layout man visited the job and made a sketch as shown in Fig. 1. The sketch need not be to scale if the dimension lines are correct, but scaled drawings always help and require but little more time to make. Every item should be indicated on this sketch. The joists, plumbing and soil pipes, stairways, windows, beams, ceiling height, etc., should be shown.

On this plan the center of the sill is used as the guiding line for all dimensions. Figs. 2 and 3 are the scaled drawings for shop use. The bench mechanics made up the duct work from these drawings. There is but one pattern in this entire system that requires any "projection." This is the fitting from the trunk-line branch to the stack and this one pattern makes the other two fittings as they are alike. The balance of the entire duct system is straight elbow and square duct work.

The offsets are shown on the plan. These offsets are necessary to get the trunk line and branches under and over the sill.

Figs. 1, 2, 3 of the basement plan show the various locations of registers, smoke stacks, flues and central sill. The necessary dimension lines are shown. When these dimensions were all taken and noted on the sketch or plan this drawing was taken to the shop where the draftsman or cutter transferred it into a one-inch scale drawing as shown in Figs. 2 and 3. One-inch scale is best as it is large enough to calculate dimensions to ¼ inch.

The various sheet metal fittings were made with the bankers lock. This lock is shown in Fig. H.

The tops and bottoms of all fittings were cut out and a ⅛-inch edge allowed for turning. This ⅛-inch edge is turned in the edging machine. This burring

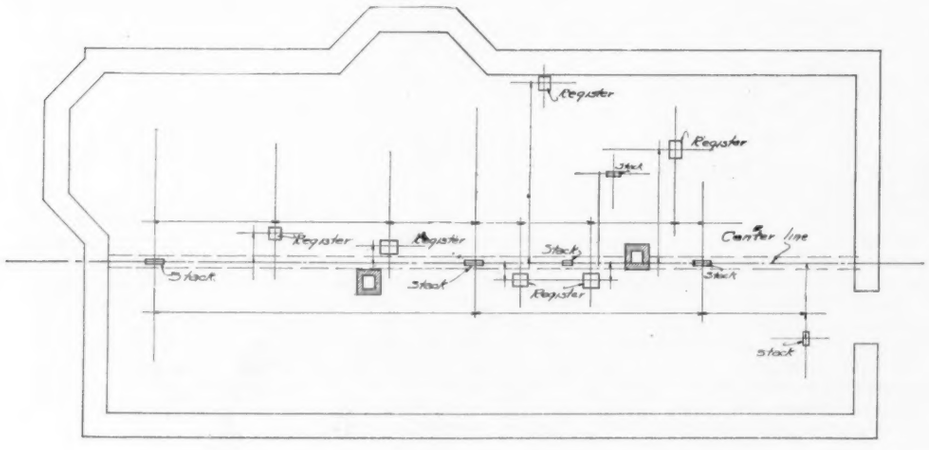


Fig. 1—The first job in laying out the duct work was to make an accurate scaled drawing of the basement. Every structural feature should be indicated as well as locations for stacks, boots, sills, etc. Careful measurements eliminate future mistakes in section dimensions.

of the iron distorts the material in shape, but was later straightened by running it through a machine as shown in a photograph. The drive cleat edges were then turned and this member of the fittings was ready for fabrication.

The heels and throats were given a double fold as shown and formed to shape in the rollers. The sides or ends were then dropped into this slot of the "bankers" edge. They were then tacked with solder every three or four inches, and later the entire edge was skimmed. It is unnecessary to sweat the solder into small fittings of a light gauge.

There are many small fittings in this Test House as will be observed, and many of them were fabricated in the shop and erected as one piece.

It will be observed from these one-inch scale drawings that where there is an elbow or the fitting rises or drops to pass below other ducts or to miss the central sill, it was necessary to make drawings or elevations of such offsets so that they might be properly cut and sized.

Provision for Bad Measurements

The straight pipe was made in sections one or two inches longer than that square from the plan. This was to allow for any discrepancies in measurements and the locations in such cases were turned on the ends of the straight pipe when they were ready for erection.

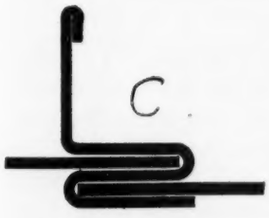
If the cutter or mechanic is sure of his measurements to a quarter of an inch such edges may be turned in the shop. It is always possible to turn at least one edge on one end of the straight pipe.

There are no difficult patterns in this entire layout, all fittings are plain sweeps and offsets requiring only the use of a square, dividers and scratch-all.

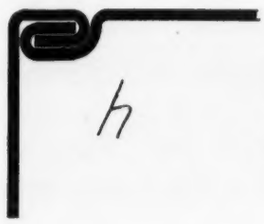
In making the original sketch showing the locations of registers and stacks, it was necessary that all soil pipes, conduits, and water pipes be located in their approximate position on the plan. It was also necessary to make cross sections of the various fittings as they had to work out to exact dimensions.

Such fittings may be made of 28-gauge iron or lighter as it will be noted that many of these fittings are small, some of them as small as 3x7 inches.

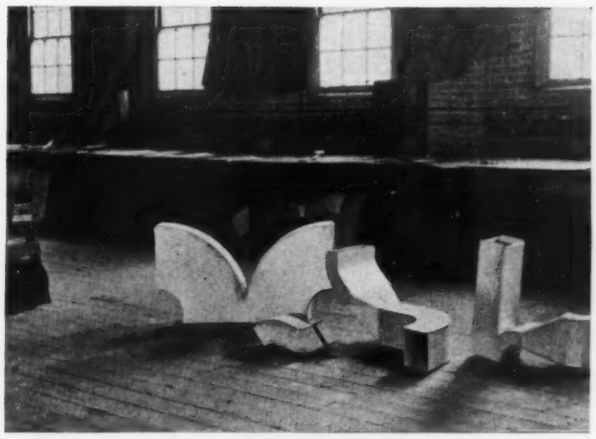
In applying the "drive" and "S" cleats, it is necessary that the drive cleats be placed on the sides of the duct as it is impossible at times to reach the duct to apply the drive cleats due to floor joists, sills, etc.



Left—Figs. H and C showing the "bankers" lock and the standing seam "S" cleats used in Test House fabrication. The text explains the reasons for these items.



Right—Figs. 2 and 3, showing scaled drawings of the duct layout. The shop mechanics work directly from these details. Note the absence of complicated fittings; the easy sweeps of elbows and transitions.



Many of the fittings were made up in the shop. Here are a few transitions and elbows.

On this particular job the throats of all elbows were made with a six-inch radius. Where smaller radii are practical the six-inch sweep works the best in the average machine and does not become distorted in shape when formed.

Throats, Locks and Elbows

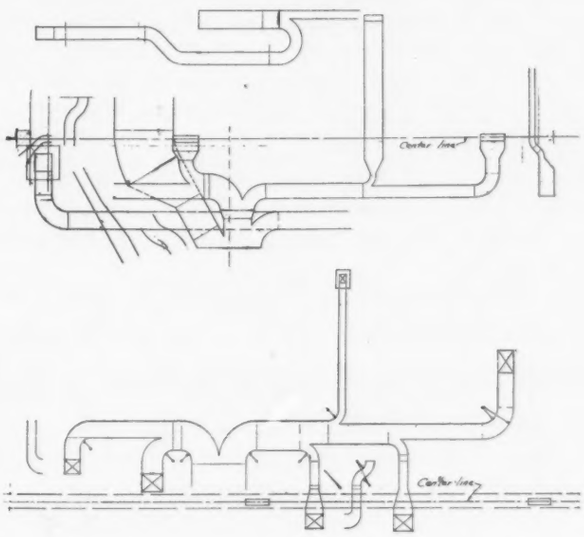
This "bankers" lock was used almost exclusively and where ducts were wide the standing seam "S" cleat was used. The standing seam "S" cleat is shown in Fig. C. No square throat elbows were used.

Where ducts were connected to the present stacks the connection was made with an "S" cleat around the four sides.

The important tools for good pattern cutting are a good scratch-all, a straight edge, a square and a steel yard stick. For large elbows it is necessary to use the trammel points.

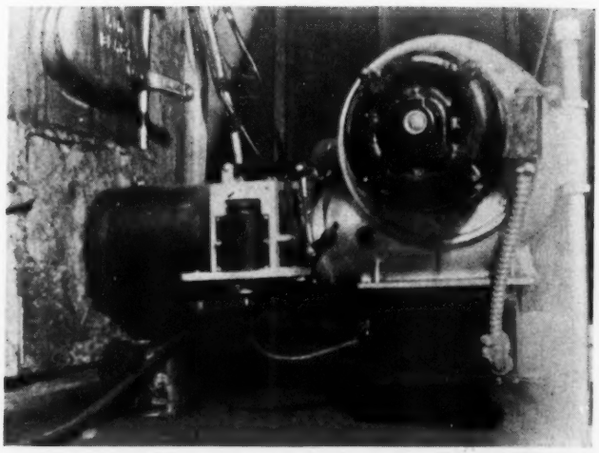
It is necessary to square the ends of all ducts to assure the runs being straight. Where the work is exposed, the bankers lock may be filed to assure the soldered edge being neat.

It should be remembered that the neat and workmanlike job is entirely a question of getting the right start and having the proper dimensions. Fittings that go back to the shop are invariably a dead loss.



Oil Smell— A Common Trouble and a Suggested Remedy

By S. S. Swift



Closeup of the air damper which allows oil to ignite slowly and air pressure to build up after combustion starts.

ONE of the commonest sources of service on new and old installations of oil burners in warm air furnaces is the smell of burning oil. Perhaps no other complaint is more common or harder to correct.

In the first place, warm air furnaces are very often bad. Many of them in our territory are 20 year old cast iron furnaces that never were much good, and should have been torn out and thrown away years ago.

Nevertheless they are there, and if the oil burner dealer wants to make the sale he must adapt his equipment to the job, or step out and let a competitor take it. This is far from satisfactory—particularly if that competitor happens to be the gas company, and the oil burner dealer is also in the oil business.

It is obvious, of course, that in every instance of this kind, the oil burner dealer should use every effort to sell a warm air furnace-burner unit, or at least a new furnace—preferably an oil burning furnace, of which there are many good makes on the market.

Not only will this give a job comparatively free of service, but it will make a very much better showing for oil generally. And last, but not least, it will practically double the sale. Furthermore, it is surprising how often this can be done by a good salesman who knows his stuff.

The real question we are considering now, however, is the job in which it is impossible to charge the furnace making it necessary to either take the contract and install the burner in the furnace as it is or refuse to take it and let some competitor have it.

In these instances there are some things that can be done.

In the first place, the cause of the trouble is the pressure that is built up inside the fire box when the burner comes on.

This pressure forces the products of combustion out through the cracks and chinks of the furnace into the jacket, and hence up the warm air pipes into the rooms of the house.

Of course the cracks and chinks of the furnace can be cemented, but they won't stay tight forever. The expansion and contraction of the metal, together with the pressure of the gases inside the furnace every time the burner comes on, loosens the cement, and this means re-cementing and service—also a dissatisfied customer.

Under these conditions it plainly will not do to make installations this way. The oil burner dealer cannot stand the extra service, or afford customers who are dissatisfied with the results of their purchase.

When coal is burned in such a furnace, there is always a pull into or draft up the chimney. Therefore, these cracks or chinks in the old furnace are letting air into the fire box. In other words, the movement of air is from the jacket inwards and not combustion gases from the firepot outwards.

Can this pressure in the firepot when the burner lights be eliminated, so that the same conditions will prevail burning oil that did when coal was burned? Yes, this can be done and is being done with pressure atomizing nozzle type burners.

The gadget used is a damper in the air pipe of the burner, operated by the oil pressure, which opens slowly when the burner comes on and allows the oil to ignite first and the air from the fan to come on gradually after the oil is ignited. The result of this action is a constant suction inwards towards the firepot, and not a pressure outwards towards the jacket.

This little device is fully developed, can be purchased at a reasonable cost all ready to install, and the installation can be made by any good service man on any burner before it is installed.

Furthermore, inasmuch as this damper is always closed when the burner is off, it prevents cold air from the basement drifting through the fan and firepot, up the chimney, wasting heat by cooling off the furnace.

In many instances a worth-while saving can be effected—thus offsetting to a degree the excessive loss caused by the inefficient furnace.

Of course, this isn't a cure-all, but it will help materially in many cases, and enable the oil burner dealer to safely sell jobs that he would not be justified in selling otherwise.

AMERICAN RENEWABLE TYPE AIR FILTERS

THROWAY

RE-NU

CLEAN AIR AT MINIMUM COST

No ONE air filter can meet all the requirements of warm air heating or domestic air conditioning. Heating methods, equipment and conditions vary, and efficient air filtration cannot be had unless the filter conforms to the characteristics of the system used. That is why American Air Filter Company manufactures a complete line of domestic air filters.

The THROWAY filter is of heavy cardboard construction in which is enclosed an efficient split-wire pad. After it has served its maximum period of usefulness the whole unit is discarded. Its resistance is lower and dust holding capacity larger than any similar type filter.

The RE-NU filter is of permanent all-metal construction, only the filter pad is renewed. Ideal for furnace fans and home air conditioning systems.

In addition to THROWAY, RE-NU and RENU-VENT filters, the American Air Filter Company manufactures three additional air filters for domestic use which make available to the furnace manufacturer or dealer a complete line of domestic filters designed to meet every air filtration need. These are;

REED E-Z CLEAN — the original warm air furnace filter, permanent type, easily maintenanced and built to last as long as the heating system itself.

DRI-FILTER Type K—inexpensive dry filter for use with automatic gas, oil or stoker fired furnaces, equipped with blowers. Its high efficiency in pollen removal makes it ideal for hay-fever and asthma relief.

WAFER — only 1⅛" thick, which meets the need for a low resistance furnace filter of the permanent type. Recommended for gas fired furnaces because of the low dust concentration in homes equipped with this type of heating system.

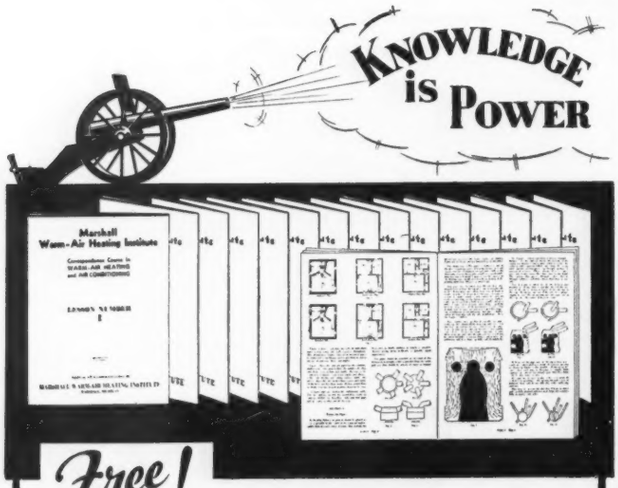
Write for circular 117-B containing complete descriptions.

RENU-VENT Filter was especially designed to meet the need for an efficient air cleaner for small ventilating and central air conditioning systems. Due to its new Progresso-Pak filter pad, when compared with two ordinary cardboard type filters in series, its cleaning efficiency is equal or better, its resistance averages 48% less and its dust holding capacity is 26% greater.

AMERICAN AIR FILTER COMPANY, *Inc.*

240 CENTRAL AVENUE IN CANADA, DARLING BROTHERS, LIMITED, MONTREAL, P. Q. **LOUISVILLE, KENTUCKY**

AMERICAN AIR FILTERS



Free! . . . *a complete*

Correspondence Course in Warm Air Heating and . . . Air Conditioning

A course well worth $75 may be secured free by the dealer who handles Caloric or Marshall Boiler Plate Furnaces. There are fifteen lessons, 100,000 words of text, 140 illustrations, 86 examination questions to be answered and 14 plans to be drawn by the student. Every student receives personal counsel and advice.

The course is written in plain, simple language, easy to understand, easy to apply. It consists of the following—

History, theory and practice of warm air heating	5 Lessons
Draft and the furnace chimney	1 Lesson
The installation of the warm air heating system	1 Lesson
Diagnosis and remedy of warm air heating complaints	1 Lesson
Evolution of the warm air furnace	1 Lesson
Forced air heating and air conditioning	3 Lessons
The sale of the warm air heating system	2 Lessons
Text book of charts, rules and tables	1 Lesson

Knowledge is power! Success comes to the man who takes advantage of his opportunities. Here is your opportunity to increase your knowledge and get an edge on your competitor. Fill out the coupon and find out how you can secure this course —Free.

Marshall Furnace Company

Marshall, Michigan

Heating and Air Conditioning Equipment
54 Years Continuous Service

MARSHALL FURNACE COMPANY,
Marshall, Michigan

Send me information on how I can secure your Free Correspondence Course.

Name .....

Address .....

City ..... State .....

AA2

Research Residence

(*Continued from page* 31)

temperature, and hence to reduce the temperature gradient.

Effect of Room Construction

Rooms that have much exposed wall and glass surfaces, such as sun rooms, are affected more by weather variations than are rooms of lesser exposure. As a general rule, good house construction and least exposure of the rooms to the outdoors are conducive towards the condition of minimum temperature gradient. The use of weather stripping, storm sash, and wall insulation, therefore, not only tends to reduce the heat loss from the structure, but at the same time tends to reduce the temperature gradient and to increase comfort conditions.

The effectiveness of storm sash in reducing the downward draft of cold air usually present with unprotected windows, is shown in Fig. 3. The temperatures, at the locations indicated by A, B, C, and D in the diagram at the right of Fig. 3, are shown on the curves at the left for various outdoor weather conditions. The thermometer at location D indicates the temperature of the current of air coming down over the windows. It may be noted from the curves and from Table I that this temperature was approximately three to four degrees greater for the windows equipped with storm sash than it was for those not so equipped.

TABLE I

Outdoor Temp.	Sill Air Temperatures, D: Single Sash Windows	Sill Air Temperatures, D: Double Sash Windows (felted)
50°	64.5	67.0
40°	62.0	65.5
30°	60.0	64.0
20°	58.5	63.0

The Case of the Sun Room

The exposure conditions that prevail in the usual sunroom are so severe that the installer should pay especial attention to the heating requirements of such rooms. Usually one or more of the following conditions prevail in such rooms:

a. Large glass area.
b. Large amount of crackage around windows.
c. Cold floors over unheated basement.
d. Outdoor exposure on three sides.
e. Outdoor exposure over ceiling surface.

Rooms that are of such construction are subject to the following heating complaints from the home owner:

a. The heat loss from the room is excessive.
b. The floor temperatures are too cold, especially when the space below is unheated.
c. With intermittent operation of the forced-air system, the room cools off too much when the fan is not running.

(*The cooling rate of sunrooms when the heat is not being delivered may be twice as great as that in the other rooms of the house for a short period.*)

d. The air quantity necessary to heat the room may be so large as to cause a drafty sensation.
e. The radiation effect of the cold glass surfaces may be chilling to the occupant.
f. All the heat in the room is up at the ceiling.

It is good engineering practice to insist that the conditions in such rooms be modified in any one or more of the following ways:

a. Use tight fitting, felt stripped, storm sash on all windows.
b. Use weatherstripping around window frames.
c. Calk joints at window frames.
d. Use ceiling insulation.
e. Install warm air registers to counteract cold drafts from windows.
f. Install cold air return grilles near exposed walls.
g. Insulate floor.

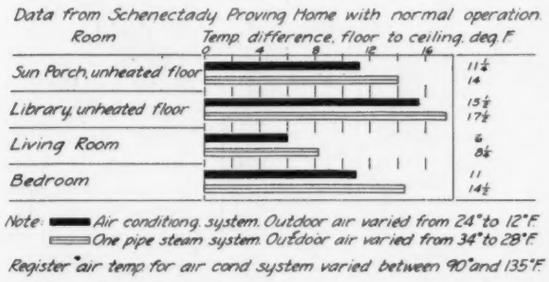

Data from Schenectady Proving Home with normal operation.
Room
Temp. difference, floor to ceiling, deg. F.
0 4 8 12 16
Sun Porch, unheated floor
11½
14
Library, unheated floor
15½
17½
Living Room
6
8½
Bedroom
11
14½
Note: Air conditiong. system. Outdoor air varied from 24° to 12° F.
One pipe steam system. Outdoor air varied from 34° to 28° F.
Register air temp. for air cond system varied between 90° and 135° F.

Fig. 4—Maximum temperature differentials for two types of heating systems in a Schenectady, N. Y., proving home.

h. Use heavy drapery on windows to shield against radiation effect of cold windows.
i. Use zone control system and maintain temperatures in the sun room independently of other rooms.
j. Insulate heat pipes to the room to maintain high register air temperature and keep air quantity to room a minimum value.

Effect of Type of Heating System

The temperature gradient existing in a given room is also dependent upon the type of heating system in use. In this connection, Harrington and Mears have obtained some interesting data in the Schenectady, N. Y. Proving Home which was operated with both a single-pipe, steam heating system and a forced-air system. (See paper entitled "A Proving Home for Air Conditioning Investigations.") The results from the paper have been presented in revised form by the writer in Fig. 4. Note that the results obtained with the forced-air system were in every case more favorable than the results secured with the steam heating system, even

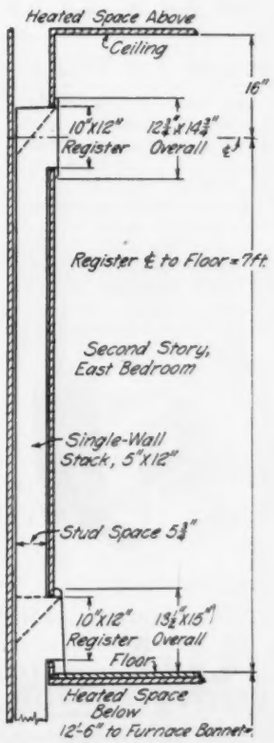
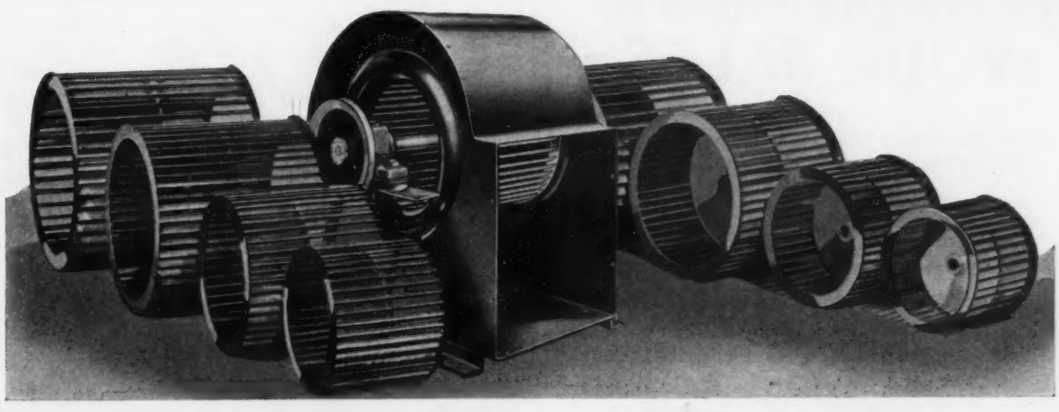


Fig. 5—Details of registers and stack with baseboard and high side-wall registers.



New Low FURNACE BLOWER *Prices!*

ANY PART OR COMPLETE ASSEMBLY.

FAN WHEELS. Bishop & Babcock fans are of the double inlet, double width, squirrel cage type, made up with all parts die formed. The fan wheel is designed without restrictions of inlet and is hot galvanized after fabrication, thereby eliminating the possibility of rusting. Each wheel upon completion of the assembly is given a perfect static balance and an absolute dynamic or running balance on machines especially designed for this purpose. The wheels run true and without vibration at all speeds. Also the squirrel cage fan wheel is of the slow speed type which further reduces the possibility of noise.

THE BISHOP & BABCOCK SALES CO.
CLEVELAND OHIO

MAIL THIS COUPON

The Bishop & Babcock Sales Co.,
Cleveland, Ohio.

Centlemen: Send me complete information on the new low priced B & B Furnace Blowers and fan wheels.

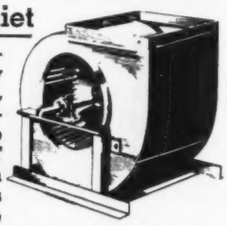
Name .....
Address .....
City ..... State .....
Atten. of .....

FAN WHEELS AND ASSEMBLIES

Any Size and Any Width

For furnace manufacturers who buy wheels only, Clarage offers any size desired, and can meet any quantity requirement. Clarage Wheels can be furnished standard width as shown at left, or any percentage of standard width to deliver a specified volume of air at any desired operating speed. All wheels are PERFECTLY BALANCED BOTH STATICALLY AND DYNAMICALLY. They run smoothly and quietly without vibration. Special wheels of special metals can be furnished.

Low Speed and Quiet



Clarage Furnace Fans combine many advantages. They are positive in performance, centrifugal type, very compact, highly efficient, and the low speeds insure SILENT OPERATION. Built as shown at right, or with inlet boxes added. Inlets and outlet are drilled with holes for easy attachment to ducts.

Clarage Fan Company, Kalamazoo, Mich.

CLARAGE
Air Handling and Conditioning Equipment

Increase the Scope of YOUR SALES—

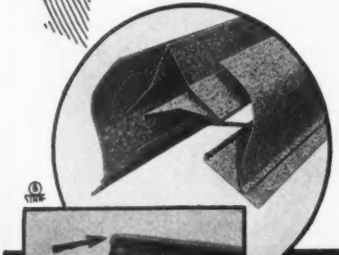
The Dexter Heat Valve is "all purpose" in its scope—RESIDENCES, commercial and factory buildings.

It lowers interior temperatures in hot weather.

Take advantage of "Home Modernization" loans. It dovetails perfectly with Home Modernization.

The field is there—the money is available—the rest is up to YOU—write for our idea on how to help you.

The SWARTWOUT COMPANY
18615 Euclid Ave.
Cleveland, Ohio



Industrial Ventilation with the Swartwout Rotary Ball Bearing Ventilator offers another profitable field for Sheet Metal Workers—ask for details.

For the Removal of Excessive Heat From
RESIDENCES · COMMERCIAL BUILDINGS · FACTORIES

though the outdoor air temperatures were appreciably colder for the former case.

a. Gravity Operation.

Studies made in the Research Residence on the room temperature conditions obtained with a gravity warm-air installation indicated that high sidewall register locations were not suitable for gravity heating.

The arrangement and dimensions of the warm air stack and registers are shown in Fig. 5. The sidewall register was the same size as the baseboard register and was placed at the head of an extension of the stack for the baseboard register in order to facilitate changes from one position to the other. Both registers had a free area of 70 per cent. When the sidewall register was in use, the baseboard outlet was sealed with a flat plate placed with the inner face flush with the wall of the stack. Similarly, when the baseboard register was in use, the stack was sealed just above the baseboard outlet and the register valve was placed in the normal position. Hence, in either case, the stack was continuous and without offsets or projections. The location of the registers relative to the exposed walls of the room is shown in Fig. 6.

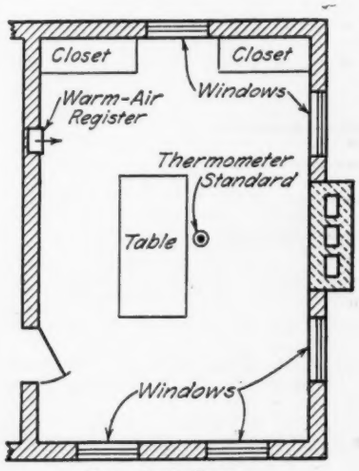


Fig. 6—Location of register with respect to exposed walls in east bedroom of the Research Residence.

Under gravity operation, the effect of increasing the height of wall stack from the baseboard to the sidewall register was to increase the motive head, resulting in a corresponding increase in the amount of heat delivered at the register face. For instance, for a register air temperature of 130 deg. F., an increase in the height of the register above the heater from 14½ ft. to 21 ft. increased the heating effect at the registers by approximately 20 per cent.

However, the greater amount of heat delivered by the sidewall register as compared with that from the baseboard register did not result in either a higher temperature at the breathing level or a better temperature distribution in the room. See Fig. 7. It is evident that the surplus heat from the high sidewall registers caused higher ceiling temperatures, while the lower part of the living zone was unaffected.

b. Booster Fan Operation.

In the Research Residence tests, as reported in Bulletin 246, the volume of air circulated by a "booster" or "propeller" type fan, placed in the cold air shoe or in the furnace bonnet of a freely circulating, warm air system, was greater than the air volume circulated by the same plant under strictly gravity operation. *The increase in air volume with the use of the "booster" type fan was not sufficiently great, how-*

ever, to make any marked improvement in the temperature gradients in the rooms.

For instance, the results shown in Table II indicate that the total temperature difference from floor to ceiling was 8.8 deg. F. for the gravity warm air system, and 8.2 deg. F. for the "booster" fan system. It is possible that in installations where "booster" fans are used to assist poorly operating, gravity systems, which have an insufficient amount of return area and leader pipe area, that the improvement in room temperature conditions may be greater than that indicated in Table II. However, it is evident that in order to make any marked improvement in room temperature gradients the air quantities circulated through the system should be increased by a greater ratio than that obtained in the Research Residence plant. In the test tabulated in Table II, the increase in air volume was from 685 c.f.m. to 920 c.f.m. or an increase in air volume of approximately 34 per cent.

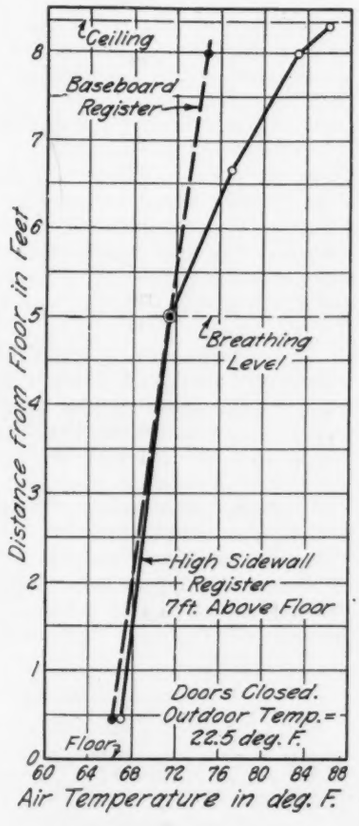


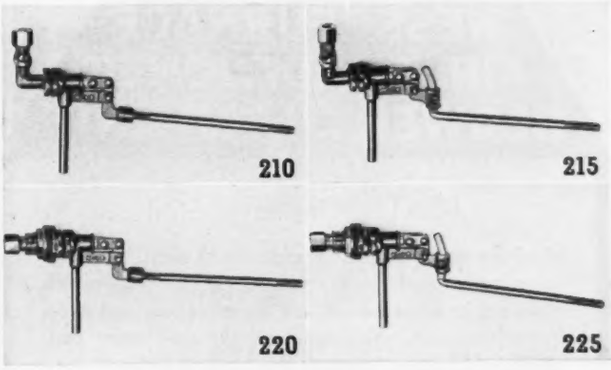
Fig. 7 — Room air temperature gradient curve for two heights of warm air registers. (Gravity warm air tests.)

TABLE II

Temperature Gradients with "Booster" Type Fan Placed in Gravity Heating Plant
Research Residence Tests
Summarized from Bulletin 246

	Gravity Warm Air System	Booster Fan in same Plant (Bonnet type)
Register Air Temp. (approx.)	115 deg. F.	105 deg. F.
Volume of air.....	685 c.f.m.	920 c.f.m.
Temp. Gradients		
a) Breathing level to ceiling	3.4 deg. F.	2.9 deg. F.
b) Breathing level to floor.	5.4 deg. F.	5.3 deg. F.
c) Floor to ceiling.....	8.8 deg. F.	8.2 deg. F.

NOTES:—Outdoor air temperature approximately 20 deg. F. for both tests.
Temperature gradients are the averages from eleven rooms in the Residence.



YOU CAN FIT EVERY FURNACE WITH AN M - V B HUMIDIFIER VALVE

Most warm air furnaces call for manual filling of the water-pan. Those who equip theirs with the M-VB Humidifier Valve will have the opportunity to sell Health, Convenience and Comfort as well as Economical Heating. No warm-air furnace is complete without one.

Water-pan design varies—so we have made this M-VB *Automatic* Humidifier Valve in four numbers, one to fit any construction you meet. For installation through top or side of the water-pan. For set or adjustable float position. Minimum efficient working space—12" length by 4" depth. In all types, moving parts are clear of the water, can't corrode nor stick. Valve-plunger is chromium-plated, seating against a special washer that resists heat and live steam.

Action of this valve is *entirely automatic,* maintaining the correct water level at all times, without attenion. Famous M-VB Quality construction guarantees long life with the best of service.

All fittings for a complete installation come packed in a neat box, with full instructions. They include (1) the Valve (any type); (2) complete strap-valve assembly to fit ⅜", ½", or ¾" IP size pipe; (3) 10 ft. of ¼"—20 ga. soft copper tubing; (4) copper float.

But little change in design is needed. Most water pans can be so equipped by simply providing the proper holes in the cover or end of the pan and packing the unit in it.

The advantage will be to those who use them in 1935.

M V B

MORENCY-VAN BUREN DIVISION
Scovill Manufacturing Company
Sturgis Michigan
A COMPLETE LINE OF CLOSET TANK FITTINGS

HESS FURNACE
AIR CONDITIONER
BLOWER FILTER UNIT

BEAT COMPETITION!

Most furnaces are of conventional design, almost the same except for the name. Hess Furnaces are different in appearance and construction and excel in performance. You can beat the mail order concern and ordinary competition with the Hess line—different and better, priced as low as ordinary furnaces.

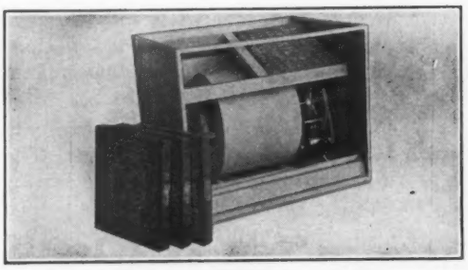
GREATER VALUES—EASIER TO SELL

Hess welded steel furnaces are rectangular in shape throughout—not merely a round furnace covered by a square casing. The Hess fire box is lined with firebrick 2½ inches thick and thicker on larger sizes, comes in large sections—not ordinary small bricks. Many other features for best efficiency and salability, developed over many years of merchandising and manufacturing, make the Hess Line the most profitable for the dealer.

WRITE FOR DEALER PORTFOLIO
HESS WARMING & VENTILATING CO.
1211-27 S. WESTERN AVE., Founded 1873
CHICAGO, ILLINOIS

INSIST ON THE AIR PACKAGE!

MORE FILTERS Longer Life Better Cleaning Greater Satisfaction
1000 CFM



COMPLETE with Miles Automatic Louvres or Minneapolis Furnacestat —Your Choice.

New Low Price—Only $55.00
Net F. O. B. Cleveland

FILTERED AIR for the SUMMER! Open the back to circulate the cooler air from the basement.

AND — a money back guarantee of complete satisfaction.

Successor to the Warm Air Furnace Fan Co.

Air CONTROLS INC.

1935 W. 114th St., Cleveland, Ohio

c. Forced-Air Operation.

Much greater air quantities could be circulated by means of the centrifugal fans used in the forced-air system than could be circulated in either the gravity system or the "booster" fan system. Table III shows a summary of the results obtained in the Research Residence with the forced-air system for both continuous operation of the fan and intermittent operation of the fan. For purposes of comparison the temperature gradients obtained with the former gravity plant in the Residence are also included in the table.

The results indicate that the temperature gradients from the floor to ceiling improved approximately 1.4 deg. F. when the gravity system was changed to the forced-air system operating with intermittent fan operation. The best results were obtained with continuous operation of the fan in the forced-air system, since the gradient was reduced from 8.8 deg. to 5.7 deg. or 3.1 deg. in all.

The results tabulated in Table II and Table III are represented in graphical form in Fig. 8. The following general conclusions may be drawn:

(1) By increasing the quantity of air circulated, the temperature gradient is decreased.

(2) Continuous operation of the fan produces better room temperature conditions than does intermittent operation of the fan.

(3) Since various types of warm air registers can be used with a forced-air system, it is possible that the results obtainable with a forced-air system can be improved if proper types of registers are used.

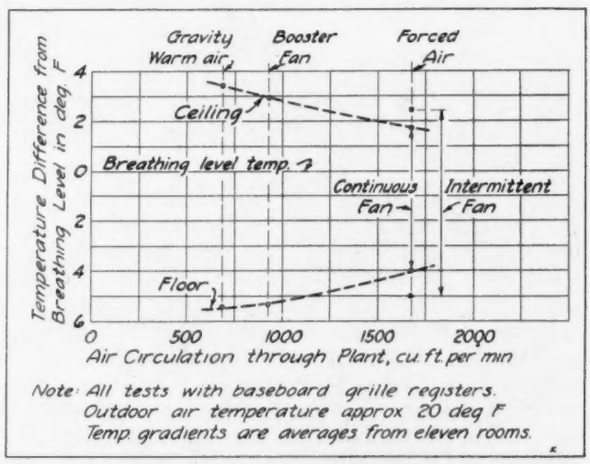


Fig. 8—Temperature gradients with gravity booster fan and forced air system.

TABLE III
Temperature Gradients with Forced-Air System
Research Residence Tests
Summarized from Bulletin 266

	Gravity Warm Air System	Forced air system Fan operated Intermittently	Fan operated Continuously
Type of warm air register used	Baseboard grille	Baseboard grille	Baseboard grille
Volume of air.....685 c.f.m.		1675 c.f.m. with fan on	1675 c.f.m.
Temperature Gradients			
a) Breathing level to ceiling ..	3.4	2.4	1.7
b) Breathing level to floor	5.4	5.0	4.0
c) Floor to ceiling	8.8	7.4	5.7

NOTES:—Outdoor air temperature approximately 20 deg. F. for all tests.
Temperature gradients are the averages from eleven rooms in the Residence.

Author's Note:—The succeeding article will continue the discussion with reference to registers.

Mechanical Code Chart

(*Continued from page 32*)

An Installation Problem

Now let us design a representative job.

Figure 1 is an orthographic sketch of a skeleton layout obtained after the approximate locations of the heating plant and the various registers have been ten-

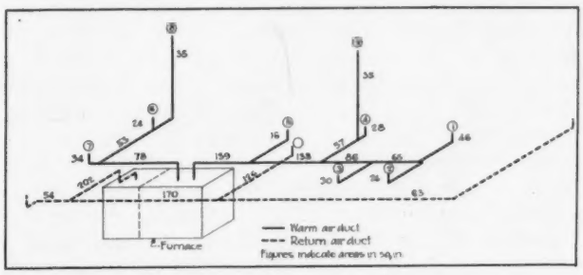


Fig. 1—Sketch of a piping system showing area of warm air leader pipe required. Table 1 below shows a data sheet for this plan.

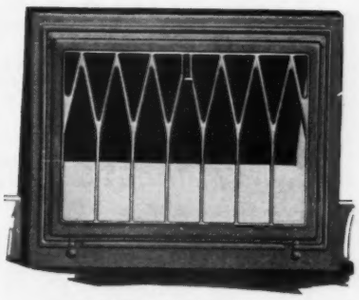
tatively decided upon. We will assume that rectangular ducts of little depth are to be used and, just for the sake of design, that we cannot take advantage of any joist spaces for conduction of return air. Room numbers are given in circles. Having room basic fac-

Table I

Room No.	Room Basic Factor	Register Temperature	Air Volume	Register Area	Register Size	Leader Size (600 f.p.m.)	Riser Size	Return Volume	Return Face Area	Return Duct Size
1	12.2	140	153	84	14x10	11½x4	.....	...	...	.....
2	7.0	140	87	48	14x 6	6½x4	.....	240	130	10½x6
3	8.1	140	100	55	12x 8	7½x4	.....	...	...	.....
4	7.5	140	93	51	12x 8	7 x4	.....	462	240	21x6
5	4.0	140	50	28	10x 6	4 x4	.....	...	...	.....
6	6.5	140	81	46	10x 8	6 x4	.....	...	...	.....
7	9.0	140	112	62	12x10	8½x4	.....	193	105	8½x6
8	8.3	140	103	57	12x 8	.....	3½x10	...	...	.....
9	9.4	140	116	63	12x10	.....	3½x10	...	...	.....
Totals	72.0		895							

Required heat output of furnace = $\frac{72 \times 1000}{0.85}$ = 84,900 B.t.u. per hour.

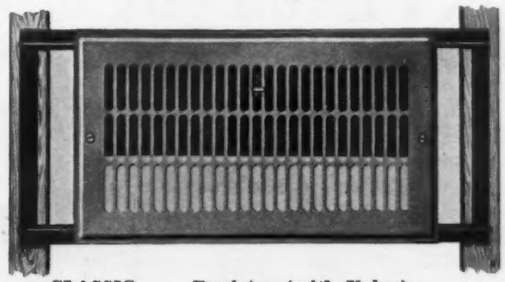
Required fan capacity = 895 x 1.15 = 1029 c.f.m.



WINNER
MODEL
Two Piece
No. 800

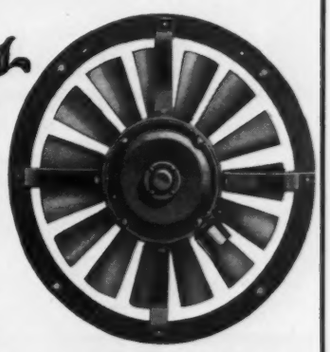
The AUER REGISTER CO.
3608 PAYNE AVE.
CLEVELAND, OHIO

Send for new Catalogue of Gravity and Forced Air Registers.



CLASSIC Register (with Valve)
No. 2010 for WALL, Slide Frame 5/8" Deep
No. 2020 for BASE, Slide Frame 1 3/8" Deep

Peerless
MULTI-BLADE
EXHAUST FANS

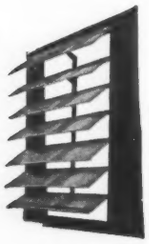


The many superior features of Peerless Exhaust Fans will help you get the profitable Ventilation business in your locality. Use the coupon for full details and prices.

Direct Drive Blowers
Washer Units
Attic Fans
Motors

The Peerless Electric Company
Warren, Ohio
Name.....
Address.....
Bulletin 204

AUTOMATIC LOUVRES



The AUTOVENT Automatic Louvres are another item in the most complete line of Ventilating Fans and Blowers offered the Warm Air Trade.

A beautifully illustrated (in color) Engineering CATALOG is waiting for you.

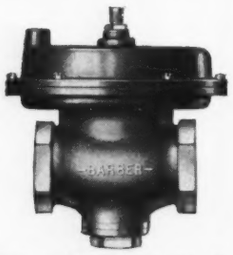
Write

AUTOVENT FAN AND BLOWER CO.
1825 N. Kostner Ave., Chicago, Ill.

AN AUTOVENT PRODUCT

SAVE *on gas bills!*

That's what everyone of your customers is trying to do—get gas bills down as low as possible. With a BARBER Gas Pressure Regulator on any gas appliance, gas bills will be much lower. Show one to your customers, take the orders and the profit. Write for details, and new Catalog 35.



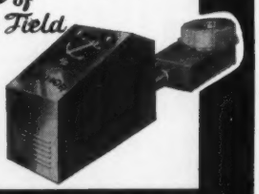
Made in ¼", ⅜", ½", ¾", 1", 1¼", 1½" and 2" sizes.

The Barber Gas Burner Co.
3702-4 Superior Avenue
CLEVELAND - - - - OHIO

Anchor KOLSTOKER

Best engineered stoker on market today. Attractive design appeals to eye; economy and performance appeal to purse. Easily installed in any heating plant now in service. Designed for homes, churches, green-houses, hotels, apartments, schools, laundries, dry-cleaning plants, factories, store-buildings, etc. Made in 17 sizes; complete coverage from homes to 400 h.p. boiler plants. Tremendous sales possibilities for wide awake distributors and dealers. Write for full information.

10 Years Ahead of The Field



PAT. PEND.

ANCHOR STOVE and RANGE CO. *INC.*
NEW ALBANY ESTABLISHED 1865 INDIANA

tors for these rooms as given in Table I, we proceed with design.

We are going to use a register temperature of 140 degrees throughout (the code specifies no allowances for temperature drop in ducts), so we can stick a pin into scale 1 at the 140-degree mark. Then, keeping the left end of our straight edge against this pin, we find the various room basic factors on scale 2 and in a very short time we have completed all of column 4 in Table I.

Next we complete column 5, giving register areas. We have chosen to use a register velocity of 300 f.p.m. throughout, so we can stick a pin at the 300 mark on scale 4, place our straight edge against it, and, using the air volume figures of column 4, quickly obtain all of the values set down in column 5. We can now select our register sizes. The purpose of getting register sizes before the design of the piping system is that, should the required size of any register be greater than we want to use or than available, we will have to change our piping layout so that two registers can be used where we had planned only one. The sizes set down in column 6 are for baseboard registers listed by the manufacturer.

Pipe Sizing

Now we proceed with the design of the individual pipes, ducts, or leaders. We do this by aligning values of air volume on scale 3 as taken from column 4 of Table I with the velocity of heated air we want to use (600 f.p.m. is assumed in this instance) at the left of scale 4, to obtain results on scale 5. We now hold these points on scale 5 and by use of scales 6 and 7 obtain the sizes of rectangular ducts to use. These are set down in column 7 and 8 of Table I.

In column 9 we set down the air volumes to be handled by the cold air return faces we have tentatively located on our sketch. The rooms which are intercommunicating and contributing return air to the faces we have indicated are shown combined. We add together the air volumes for these combinations as shown. We now fill in column 10 as we did column 5 and next fill in column 11 in exactly the same way we did column 7, but using the right hand scale of 4 in both instances.

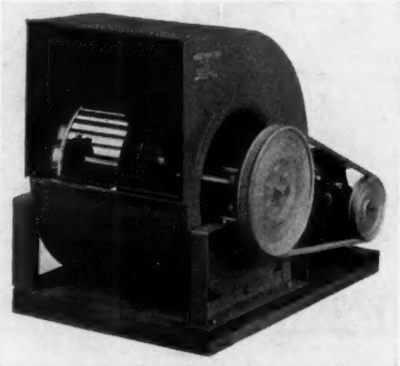
We can now jot down the duct areas on the respective leaders on our sketch and combine them according to section 5 (b) of the third edition of the code.

For Heating Ventilating or Air Conditioning

Prices as listed are for fans less motor, pulley and belt.

8" wheel ⅛ HP motor CFM 850 ⅛ SP—$9.50.
10" wheel ⅛ HP motor CFM 1200 ⅛ SP—$12.00.
12" wheel ¼ HP motor CFM 1650 ⅛ SP—$16.50.
16" wheel ½ HP motor CFM 2250 ⅛ SP—$25.00.

GRAND RAPIDS DIE & TOOL CO.
117 Michigan St., N. W.
Grand Rapids, Mich.



Automatic Control (*Continued from page* 34)

the thermostats are satisfied when our draft closes and the fan stops. Therefore, we need quick response on the room temperature drop cycle and just as quick deceleration on the room temperature rise cycle. We must produce heat quickly and dissipate all heat just as rapidly. This means we must have a clean fire and a good fireman and a well balanced furnace-fan-duct system. Also we need good chimney draft and a tight furnace so that fire acceleration will stop when the draft closes.

Some functions of this system can be analyzed and established with very little difficulty. For example, there is no real problem with our fan because it starts and stops as the zone thermostats dictate. Given a sensitive thermostat the fan operation will be satisfactory. Likewise our zone thermostats control our draft door to open the draft when the zones need heat and close the draft door when all thermostats are satisfied.

The setting of the auxiliary fire control is the function requiring experiment. The temperature setting must be high enough to permit the fire to keep up with the fan—in other words our fire must be allowed to accelerate enough to generate heat as rapidly as the fan carries it away when **all zones are calling for heat.** Such a condition is likely to place a heavy demand on the furnace.

At the same time we will want to set the instrument low enough so that on a fire accelerating cycle the draft will close ahead of the command of the thermostats when only one zone is calling for heat.

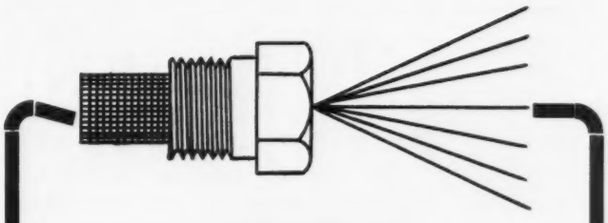
Just where to make this setting will depend on the peculiarities of each installation. If there are a large number of zones we may have some difficulty getting a setting high enough to satisfy when several zones are calling for heat and at the same time low enough to shut down the fire quickly when only one zone calls for heat.

Instrument Differential

We will want to consider the problem of using an instrument with a wide differential or one with a small differential. The thing we are after is to establish a temperature which permits our furnace to produce enough heat to satisfy our house should all zones call for heat at once and at the same time close the draft when this setting is reached. Probably an instrument with a readily adjustable differential will be most satisfactory. We will use the differential to permit the fire to decelerate after reaching its peak and thus extract the heat from castings and system; then if the thermostats are still calling for heat the draft will open again. We must fix the differential so that our fan does not stop on its "low limit" before the draft opens again.

The fan cutoff serves only one purpose—to stop the fan should air temperatures get so low that the register air temperature will feel chilly. This control is expected to operate only when the fire is neglected and cannot respond; or the heat demand on the furnace has been too great and the furnace cannot keep up with the demand.

An interesting application of these two safety instruments has been tried out on large installations by one contractor who sets his fire limit control **below** the point required should all zones open simultaneously and at the same time sets his fan cutoff



MONARCH
AIR CONDITIONING SPRAYS

For air conditioning work our ¼" Fig. H-261 shown above, or ⅜" Fig. H-256 (not shown) male pipe thead brass nozzles break the water up into the finest spray possible with direct pressure. Either size furnished with or without strainer.

Bulletin No. 18

MONARCH NON-CLOG NOZZLES

For air washers, etc., we recommend either ¼" or ⅜" Fig. 631 (female pipe) or ⅜" Fig. 629 (male pipe) nozzles. One large lead hole decreases possibility of clogging.

Catalog 6-C

MONARCH MFG. WKS., Inc.
3303 SALMON ST.
PHILA., PA.

COOK TYPE 15
WARM AIR FURNACE SWITCH

Cook type 15-6 Furnace Switch is the perfect companion of Cook No. 12 Heat Control.

Greater protection for the furnace and additional savings of fuel, as well as closer regulation of house temperature is obtained by the use of a limit control.

Overshooting of house temperature during the morning pickup and runaway fires, should windows be opened for an "airing out" of the house, are prevented when a limit control is used.

Cook 15-6 Furnace Switch is the perfect limit control.

Manufactured by

COOK ELECTRIC COMPANY

2700 SOUTHPORT AVE. CHICAGO, ILL.

TORRINGTON
FANS AND
BLOWER WHEELS

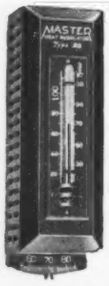
Patented All Aluminum Multiblade, Balanced Blower Wheels. Unexcelled for quiet and smooth operation.

32 years' experience building Propeller Fans—assembled, balanced and tested ready to mount on motor shaft.

THE TORRINGTON MFG. CO.
14 FRANKLIN ST.
TORRINGTON, CONN.

A GENUINE MASTER REGULATOR

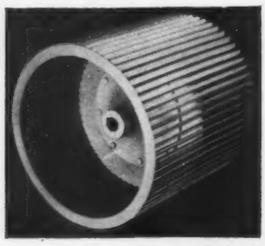
ONLY
$13.50 to Dealer
Type B-22 Two-Position
NEW DAMPER
REGULATOR



A MASTER product priced low enough for the volume market. Quiet, efficient, sturdy. Four-pole 16-volt induction motor. Small transformer mounted outside housing. Get complete details on this —*NOW*.

WHITE MFG. COMPANY
2362 University Ave.,
St. Paul, Minn.

GET OUR 1935 PRICES



on Arc-Welded Wheels and Scroll Housings

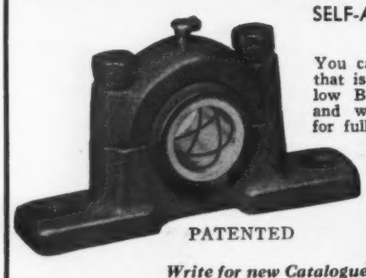
for furnace blowers, air-conditioning units, stokers, oil-burners, etc. Always dependable, reasonably priced. Let us quote on your requirements.

Write for proposition on full air conditioning line.

U. S. AIR CONDITIONING CORPORATION
2105 Kennedy St. N. E. Minneapolis, Minn.
Pioneer Makers of Complete Air-Conditioning Equipment

RANDALL PILLOW BLOCKS

SELF-ALIGNING
SELF-LUBRICATING



You can always be sure of a job that is equipped with Randall Pillow Blocks. It will run quietly and without interruption. Write for full details today. Let us tell you why Randall Pillow Blocks have become standard equipment with the leading manufacturers.

Randall Pillow Blocks now have the ball machined and races ground insuring accurate fit.

PATENTED

Write for new Catalogue just out

RANDALL GRAPHITE PRODUCTS CORP.
609-613 WEST LAKE ST. CHICAGO, ILL.

somewhat above the temperature actually required to keep register air from feeling chilly. This contractor is really gambling on his system never having all zones open at one time and also on cutting off his fan before actually required.

System Number 2

The operating cycle of system number 2 is much like system one except that we use a relief zone to dissipate excess heat. The cycle can be outlined as follows. We have a relief zone. Let us suppose a zone calls for heat. The zone thermostat causes the zone damper to open; causes the furnace draft door to open; causes the fan to start. Our low limit fan control allows the fan to run if bonnet air temperature is high enough, but keeps the fan from running if the bonnet temperature is too low. Our fire high limit control shuts the furnace draft door if temperatures get dangerously high even though some zone is still calling for heat. Should temperatures become dangerously high after all zones are satisfied, our relief zone control opens the duct damper to the relief zone and starts the fan.

The use of a relief zone is a safety measure. It is recommended wherever possible. The choice of a relief area need not be a troublesome problem. If we have some section of the house such as a garage or a sun porch we can make this room our relief zone. If, on the other hand, we do not have such a room, then we must make one of our regular zones a relief zone and accept the fact that this zone is likely to be over-heated at some time in the winter. We can use the basement as a relief area and use the heat to warm the floors.

Consider, first, a relief zone into a garage. We know that if we keep the garage up to 55 degrees or thereabouts conditions will be satisfactory. We may choose to make this garage a regular zone and maintain it at 55 degrees, but to raise the temperature should the relief zone operate at any time. Or we may decide to keep it at 45 degrees and occasionally raise the temperature through relief zone operation. Probably the first choice is most nearly in keeping with the quality job we have sold.

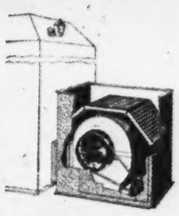
Relief Zone Operation

In this case our garage may have a thermostat and a damper and motor and will be kept at 55 degrees all the time, or can be a part of a larger zone but with reduced air volume. Our relief zone control can be a bonnet instrument which will have two contacts. When temperatures get to the relief setting one contact starts the blower should the blower be idle. The other contact opens the relief zone damper. The instrument can have quite a wide differential for once our relief zone opens we want to blow out enough heat so that the relief zone will not operate again for some time once the excess heat is dissipated.

If our relief zone is one of the regular zones we have a different problem to consider. Which zone shall it be? Very likely we will not choose a zone which we expect to have heated by the sun. If one of our second floor zones is heated to a temperature under the living quarters we may choose this zone. If we have a servant's wing, this will do. If it is a small house then very likely we will select the zone where we expect to have the most constant heat demand.

NNOX AIRE-FLO A
CONDITIONI

DE LUXE AIRE-FLO WITH WASHER



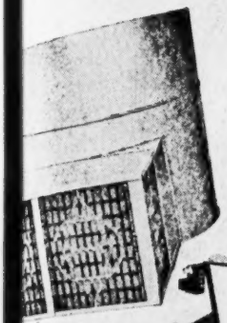
FURBLO PACKAGE UNIT

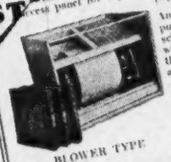
. . Can Be Sold Completely
Installed for as Little as $100

Sheet Metal Worker
61st Anniversary Number
January, 1935

OSBORN
CONDITIONER BOOST
POWERED BY EMERSON

A NEW
For applicati
return is avai
from baseme
package con
furnace fan,
housing, bou
matic hu
stat)





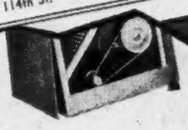
BLOWER TYPE

"AC" BLOWERS

The Air Controls line of blowers is of the same high type of efficiency and dependability. Manufacturers of special Air Conditioning units will do well to examine this splendid line of newly designed blowers.

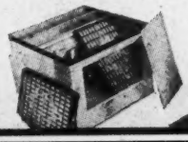
BLOWER

AIR CONTROLS, Inc.
1935 W. 114th St. Cleveland, Ohio

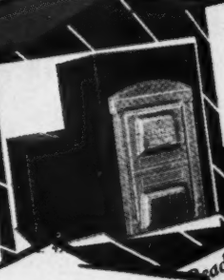


No. 1 size, with furnace any furnace.
attractively priced $52.00
to dealers at

Miles Junior Air Conditioner



"The air condition
masses." Attach
furnace, it posi
lates and filter
Miles Automat
Louvre an exclus
ed feature. Ver
ical to your No. 22
to dealers



Whether you
prestige and respon
engineering service; a
one or all of these feature
bring you complete informa

THE FOX
A Division of Ame

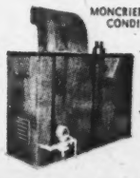
Ready soon!
PAGE HEATING MANUAL
Furnace Heating Manual
Circulating Warm Air Heating

MONCRIEF
AND AIR CONDITIONI

Moncrief Pipe and Fittin

Everything Used On a War

SERIES "B" GAS FURNACE



MONCRIEF GAS AIR CONDITIONER

MONCRIEF ARISTOCRAT AIR CONDITIONER

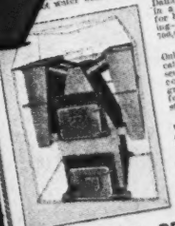
Dailair

SYSTEM OF HEATING
AND AIR CONDITIONIN
WARM AIR—SPLIT STEA

Complete
8 Stage Process
in One Unit

Compact—Attractive and Efficient

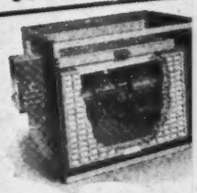
Old Fired Warm Air 8 Stage Unit



DAIL STEEL PRODUCTS
1200 MAIN ST. LANSING,

Peerless

MULTI-SPEED BLOWER



Peerless Pioneered Direct-Drive Blowers

The Multi-Speed Direct Drive Blowe
Complete Individual Scroll for Each
Insures Greater Air Capacity Against

MULTI-SPEED
EXHAUST FA

CONDITIONING UNITS OR ANY
FURNACES ON REQUEST.
PAYMENT PAPER UNDER N.H.A.
COMPLETE DETAILS

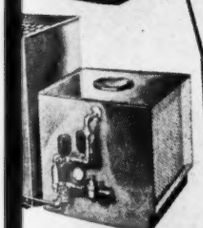
TRADE CHANNELS ONLY

INTERNATIONAL
HEATER COMPANY
UTICA, N.Y., U.S.A.

Please mention Sheet Metal Worker when you write

Sheet Metal
61st Anniversary

TERBU



ation blower and conditioner unit
quirement for the proper condi-
ing of warm air in a domestic

er sold separately for installation
ot already in use.
e information.

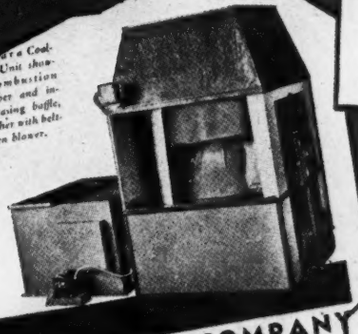
THE
& BABCOCK
ALES CO.

ND OH

"COMFORT MAKER"
Modern Heating and
Air Conditioning Plant

A new automatically con-
trolled Air Conditioning and
Heating plant that W
Costs, and Humidi
the most scientific
simplest way
automatic

Niagara catalog?



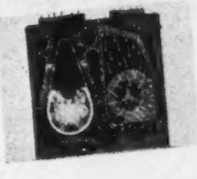
a Cool-
Unit shou
combustion
mber and in-
er casing baffle,
together with belt-
driven blower.

THE FOREST CITY FOUNDRIES COMPANY
"Heating Engineers Since 1893"
CLEVELAND, OH
2502 WEST 27TH STREET

NIAGARA WARM AIR FURNACES
ITIONING UNITS

product. Please mail
for complete details.

EAT CONDITIONAIR
Does These Things



ifies the air; humidifies the air; heats the
air automatically with the famous Delco-
Heat oil burner; circulates the air—providing
a complete change every 10 to 15 minutes;
provides clean, healthful, conditioned air all
fall, winter and spring; in the summer,
removes pollen and provides complete circu-
lation of freshened purified air.

Cross sectional view show
passing through filters an
humidifier and streamline
Streamline construction re
flow. Projectors transfer
bustion chamber refractor
after burner course operatio

MAIL C

Delco Appliance Corporati
Subsidiary of General Mot
Dept. 11-M, Rochester, N

Please send complete det
the new Delco-Heat Cond

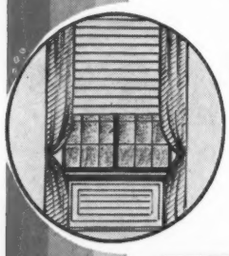
Name
Company
Street
City
Please check busines
Warm air furnis
Sheet metal
Air conditioning

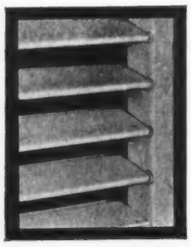
DELCO-HEAT
Conditionair

● Circulation and filtering are important parts of air conditioning. These advertisements in the January issues of your trade papers featured blowers with Dustop Air Filters for circulating clean air. Owens-Illinois Glass Company, Industrial Materials Division, Toledo, Ohio.

OWENS-ILLINOIS DUSTOP AIR FILTERS

"THE NEW Venetian Blind EFFECT"



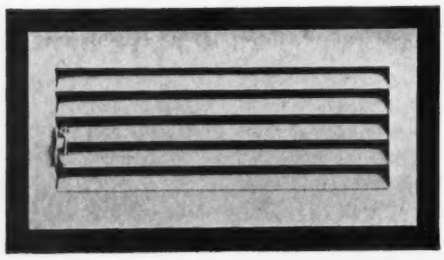


Now beauty and style enter the field of Air Conditioning Registers! Venetian Blinds are the newest vogue in home decoration. Here we carry out their beauty and smartness in Registers as well. New sales appeal! Greater practicability! And mechanical features never offered before in ANY line —note the exclusive features below.

WATERLOO Air Conditioning REGISTERS

Adjustable Control of

1. **Air Direction**—Instantly adjustable direction of air flow. Simply order the directions desired.
2. **Air Volume**—Many register sizes scientifically tested to tell you their capacities at various velocities. No "guess work." You KNOW with Waterloo Registers, and you don't have to use dampers.
3. **Air Velocity**—Complete control of air flow. Tested for sound. Add beauty to the room, conceal the duct. Frames furnished if desired.



No other registers on the market offer such beauty, style and exclusive, TESTED, mechanical advances. Specify Waterloo.

Send for Catalog
New designs, new charts and installation data, profusely illustrated. Tear out this ad and write for your copy today.

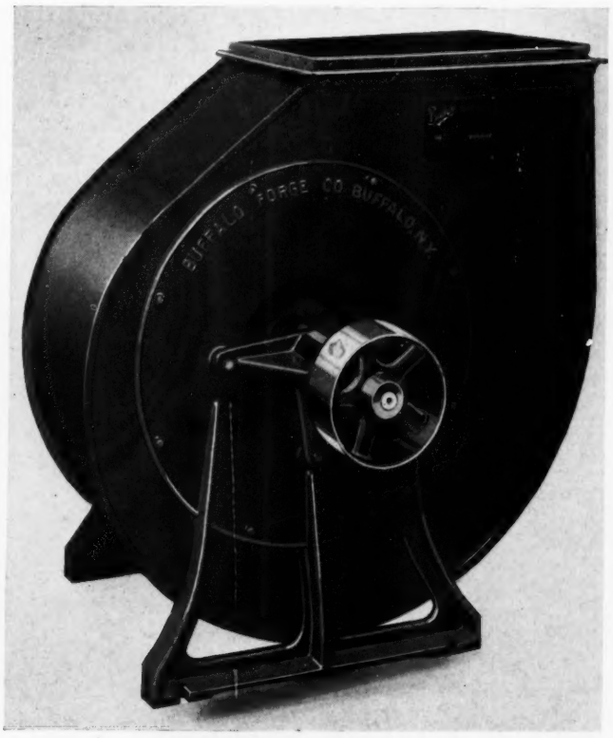
The Waterloo Register Company
Floor Registers, Floor Cold Air Faces, Baseboard Gravity Registers, Wall Registers, Steel Grilles, Wood Faces and all furnace supplies.
Waterloo, Iowa — Seattle, Wash.
In New York—Air Conditioning Utilities, Inc. 489 Fifth Ave.
In Los Angeles—California-Waterloo Register Co. 824 Clanton St.

SELL "Air Conditioning" that SATISFIES the Customer—

Dealers have a wonderful opportunity to establish themselves permanently in the field of air conditioning, if they remember that customers hold the DEALER and not the equipment, responsible for poor performance. Dealers having experienced the "grief" which inefficient equipment causes, know that low prices are relatively unimportant in this type of apparatus.

Buffalo offers a complete line of air conditioning accessories for domestic and commercial work. Disk and centrifugal fans, cooling units, comfort conditioners and air washers, all designed and built under one management assure you of intelligent design, sensible construction and fine quality. Write for Bulletin 2968 which describes the whole line.

Buffalo Forge Company
497 Broadway Buffalo, N. Y.
In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



"Buffalo" FANS COMFORT CONDITIONERS

. . . the problem corner

American Artisan:

We are very much interested in your article "Setting Dampers by Static Pressure" in the December issue of AMERICAN ARTISAN. Wonder how this will work in complicated split trunk systems. Will try and let you know. We are not quite clear as to just how the total static was read and computed. Can you enlighten us? Is it the product of actual reading times foot length? In many cases ducts are not accessible for direct readings.

D. D. Z., Kansas City, Mo.

Reply by
W. E. Keist, Pittsburgh

A copy of your letter was forwarded to me by the AMERICAN ARTISAN and in reply will try to explain what I mean and how it is applied.

No actual "Static Pressure" readings are taken, but computed on each individual duct, taking into account the size, C.F.M. and the linear feet of length including elbows with throat radius to find equivalent straight duct in feet. These are computed from a Standard Static Pressure or Friction Chart. However, there are from time to time special fittings used, for which we do not have any pressure readings, but these depend upon the individual's practical experience. So far I have rated the special fittings comparative to an elbow on that particular run of duct.

In the case of concealed ducts, it is hard to trace them, I admit; for this I can offer no solution, as the successful operation of this depends on the computed length of duct. However, on every job I have had, concealed ducts had to be calculated. This was done by careful observation and measurements as to various locations, but with the main trunk exposed. If the main trunk is concealed access to this must be had.

The larger the duct system or the more complicated it is, the more stations that are needed, from whence pressure calculations should be made. The addition of the individual pressures at each station results in the total pressure on each separate duct from unit (blower or furnace) to the outlet (register or grille). When the pressure of each duct is found, the damper settings are found as previously explained.

Roof Paint

American Artisan:

I was recently called on to inspect the roof on one of our local churches and to recommend needed repairs. This roof is flat locked 20 by 28-inch sheets laid with cleats. The metal application is good. The roof has been on about seven years and has received no paint except the initial coating. The original paint was plumbago and graphite.

I hold that the roof should be painted with two coats of lead and oil or one coat of lead and oil and one coat of aluminum. My contention is that the aluminum will fill any small cracks and that aluminum has excellent wearing qualities and gives some insulation effect.

The mortar joint under the stone coping is in very bad shape and I join the roofing manufacturers' salesman in recommending that the joint be thoroughly cleaned and refilled with plastic cement. The roofing man wants to do away with the metal counter flashing and apply plastic cement to the walls as well as paint the roof with an asphaltic preparation. The cracks under the coping allow water to get in by capillary attraction and cause trouble below. W. S. L., Oklahoma.

Reply by
J. V. Thompson

Seven years' wear is certainly excellent for any paint coating on a roof, but I rather imagine that the film of paint now existing on the roof is pretty far gone, because we have found everywhere throughout the country three year life for roof paint is the greatest service you expect to get and still have any margin of safety left or an unbroken film left.

The original application of plumbago and granite to this tin roof we do not approve of. Graphite is a rust stimulating pigment and this action on tin is not good. When this roof was originally laid the material that it should have been painted with should have been either a good red lead paint, a good white lead paint, or a good iron oxide paint. Generally speaking iron oxide paints, which are the cheapest of these three, give perfectly satisfactory service.

Insofar as repainting the roof, I don't think the application of white lead or red lead would be of particular value over top of the old plumbago and graphite paint.

A better plan would be to spot prime any rusty spots on the roof using a red oxide paint. Of course, if there are a lot of fine hair cracks in the old film of paint then the proper procedure would be to go over the entire roof with the red. Then protect that coating with a good first quality aluminum paint. The aluminum film being composed of over-lapping layers of the flat flakes of metallic aluminum is an extremely waterproof film. It bridges over tiny cracks and makes the length of travel that moisture has to go to get through the film about three to four times as long as is ordinarily the distance in paint made from granular type pigments.

Particularly in hot countries where summer sun is very strong aluminum painted roofs keep the building materially cooler than they would with other type surface coatings. We believe if you will treat this roof, giving it one good coat of red oxide paint and a coat of aluminum, you will find you will get excellent results.

◆

Garage Ventilation

American Artisan:

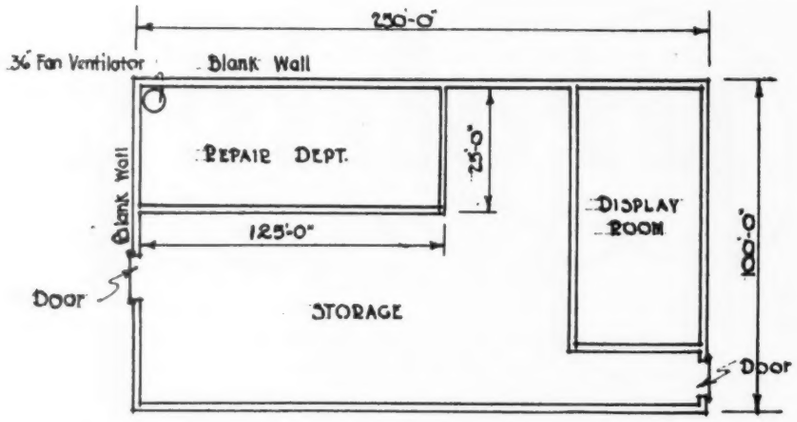
What suggestion would you offer to ventilate a repair department 25 feet by 125 feet of a garage which is 100 feet by 250 feet with a 25-foot ceiling. The roof is open steel trusses. We do not want to remove any heat in the winter if we can avoid it.

The entire floor area is open; there are no partitions. Overhead ventilation is out of the question.

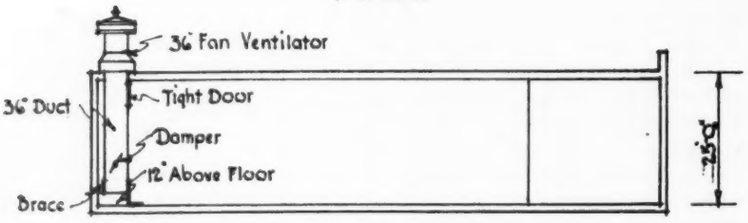
E. W., New Mexico.

Reply by
The Editors

According to our understanding you want to ventilate the repair floor, but do not want to make any provision for the remainder of the building, excepting with such ventilation as may be had incidental to your ventilating of the repair floor. In other words, you will concentrate on repair floor



PLAN



SECTION

ventilation, without regard to the rest of the building. However, if in ventilating the repair floor you help the rest of the garage, that will be so much added value.

It is of course of primary importance that gases and fumes from the repair floor shall not be allowed to flow into the other parts of the building. This can be accomplished by placing all of the exhausts within the repair floor area.

As to the matter of heat, the effect on the heating system is naturally going to depend upon what kind of heating system the building has. If it is heated by direct radiation of any kind, your ventilation can be so designed as to help the heating. If the heating is done by unit heaters, or by a warm air furnace, or by any other kind of moving warm air, the ventilation can be so designed as to have little, if any, adverse effect on the heating, with the probability of helping the heating situation rather than hurting it.

This whole problem of heat conservation resolves itself into one thing, namely to take the exhaust from the floor. This means that a duct should be run down to within a few inches of the floor. As to where this duct should be placed will depend on the intake. If the intake is from all sides, the exhaust should be at the center. If there is one blank wall, the exhaust duct should be run up the center of that blank wall. If there are two blank walls, the exhaust duct should run up the corner of these two walls. If there are three blank walls, the exhaust should run up the center of the middle wall. If the intake is from all sides and they will not let you run a duct down to the center of the floor, create a blank wall by closing all doors and windows on that particular wall and running the duct down the center of that wall.

Taking the exhaust from the floor will give very good results from the standpoint of ventilation, as well as heat conservation. Carbon dioxide and raw gasoline fumes are both heavier than air, carbon dioxide being 1.53 as compared with air of the same temperature, while raw gasoline fumes are twice as heavy as air or more, depending upon the quality of the gasoline. Carbon monoxide is almost the same weight as air, namely .97. For the heavier than air gases, the floor exhaust is ideal. For the carbon monoxide, being the same weight as air and diffusing rapidly, the floor exhaust will answer as well as any other. A ceiling exhaust then has no advantage in winter.

Inasmuch as the flue will be handling a column of cold air mixed with heavier than air gases, you will need fan action. A fan ventilator will be the good thing to use, because it eliminates the wind hazard, and does away with the necessity for weather louvres. Fan ventilators have been used very successfully in garage ventilation.

A damper should be put in the duct six or seven feet above the floor. Either a round or a rectangular duct can be used. The duct should be open at the bottom and set high enough above the floor to leave clear space equal to the sectional area of the duct. If the duct occupies center of the floor it will have to be at least one-fourth of the diameter of the duct above the floor. If it is against the wall it will have to be one-third of the diameter of the duct above the floor.

The duct should be equipped with a tight door just beneath the roof. This door should be kept closed in winter and open in summer. In summer a fan ventilator will be valuable for heat removal, and adequate ventilation will be had through open doors and windows in hot weather.

Now as to capacities, practically all ventilation tables give for repair garages a recommendation of from 80 to 160 cubic feet per hour for each square foot of floor space. For this particular garage it would be advisable to figure 160 feet. If conditions were not acute, they would not be asking for ventilation, as we assume that the building is already built. We have a total of 3,125 square feet of area. The 160 foot basis would call for 500,000 cubic feet per hour total, or 833 cubic feet per minute. One 36-inch fan ventilator ought to take care of this.

TABLE A
RECOMMENDED AIR CHANGES PER HOUR

Location of Vent Opening	Fair Condition	Bad or Crowded Condition	Extremely Bad Condition
Battery Rooms, Ceiling	8	12	16
Foundries, Roof	10	16	24
Garages (Repair), Floor	10	15	20
Garages (Storage), Floor	6	8	12
Gymnasiums, Floor	4	5	6
Heat Removal, Roof	8	16	24
Laundries, Roof	12	16	20
Machine Shops, Floor	4	8	12
Paint Shops, Ceiling or Floor	6	10	20
Power Plants, Roof	8	15	20
Schools (Class Rooms), Floor	8	8	8
Theatres, Floor	6	8	10
Toilets, Ceiling	8	15	30
Work Rooms (Wood, Cloth, etc.), Floor	4	7	10

Our Cover Photograph

The photograph on the cover of this issue shows some of the main trunks and branches of the zone piping system in the American Artisan test house. Investigations have been under way all winter designed to find the answers to some of the problems relating to the air conditioning of houses already heated by means of a boiler. The photograph shows the steam piping from the boiler to the heat transfer sections and the housing which contains the blower, motor and filters. The vertical box in the foreground is one of two identical cold air returns. Each branch has a cut off damper.

An American Artisan Survey

Code Authority Committee Reports

Month by month various code authorities are getting their areas and organizations perfected. The progress made has not always been just as anticipated. This month's section reports some new developments of particular interest. Your reports are invited.

Indiana

We enclose copies of tentative By-Laws for County District and State organization (State plan published in February issue) under the Indiana plan. We believe the plan will meet with the approval of the National Code Authority.

The Indiana plan is copied after the Government of the United States, in that it calls for administration by duly authorized representatives. These representatives are elected by the individual members, each member being entitled to one vote, so that the final authority rests with the individual members themselves. Handling it through representation, is merely the best method of ascertaining the desires of the majority, and of putting those desires into effect.

The Indiana plan can be carried on to the Zone and National administration, by a recognition of the State delegations, rather than an attempt to secure the individual opinions of all of the contractors throughout the United States, which later of course is manifestly impossible. A convention of 500 accredited representatives from the various state or areas, would be more truly representative, and would also be able to accomplish much more, than a meeting of two or three thousand individual members, representing nobody but themselves. As Mr. Markle has pointed out, it will not be desirable to set up Zone bodies. Any zone organization will doubtless be solely for the purpose of properly nominating the Zone representative. Such nomination is already indicated in form No. 9. The Indiana plan conforms throughout to form No. 9, according to our understanding.

COUNTY PLAN

NAME

This organization shall be known as the ——— County S. W. R.

TERRITORY

The jurisdiction of this organization shall be within ——— County.

OBJECTS

The objects of this organization shall be, to assist the National Recovery Administration so far as its activities are concerned, with the Sheet Metal, Warm Air Heating, Roofing and Reroofing Industries within its jurisdiction.

To formulate plans for the proper educational organization, and enforcement activities.

To provide means for the collection, allocation and disbursement of funds necessary to attain the objects desired.

To hear, carefully investigate and adjust complaints.

To protect Sheet Metal, Warm Air Heating, Roofing and Reroofing contractors, their employees and their customers from unfair trade practices, unnecessarily dangerous methods of operation, and unreasonable prices, and to do whatever else may be required and necessary to carry out the intent of the NRA and within the scope of the laws of the land, and regulations of the NRA.

MEMBERSHIP

Any member of the division as defined in Chapter VII of the Construction Code in this County, shall be eligible to membership. If its dues and assessments are paid up to the end of the quarter immediately preceding, it shall be considered a paid up member.

OFFICERS

The following officers shall be selected at the Annual Meeting subject to the approval of the State Board of Code Administration.

A President.
One or more Vice-Presidents.
A Secretary.
A Treasurer.
A Chairman, who may be the President.
A Vice-Chairman, who may be the first Vice-President.

And two subdivisional directors from each subdivision, nominated by the respective subdivisions, and who shall collectively be truly representative of all branches of the industry from both large and small shops.

The President, Vice-Presidents and subdivisional directors shall be selected by the membership at the Annual Meeting from among the membership. The Chairman, Vice-Chairman, Secretary and Treasurer shall be selected by the Subdivisional Directors immediately following the general meeting, and may or may not be members of the division.

VOTING

Each paid up member of this organization shall cast one vote on all questions.

DUES

Dues and assessments shall be as provided for by the District S. W. R.

STANDING COMMITTEES

Subdivision—There shall be one committee for each subdivision included under Chapter VII of the Construction Code. This Committee shall be made up of one person from each member firm of this organization specializing in that particular type of operation. To this Committee shall be referred all questions relating to its particular subdivision. It shall pass on such questions, and report to the County Trade Practice Complaints Committee as hereinafter provided, for approval. If the County Trade Practice Complaints Committee does not approve, the Committee may at its option appeal to the District Trade Practice Complaints Committee.

There shall be two Labor Committees, one made up of one representative from each Union Shop, where such group is represented, and one made up of one representative from each non-union shop among the membership. To each Committee shall be referred all labor questions coming under the Code, affecting either the Union or non-union groups respectively. Each Committee shall report on each question to the County Trade Practice Complaints Committee. It shall be the duty of each Labor Committee to contact the employees of its particular group, arranging for truly representative meetings. The Labor Committees can combine at their option.

Committees on Code enforcement, investigation and cost determination, shall be appointed by the Chairman, subject to the approval of the State Code Administration Board. Any Committee can elect a truly representative executive committee of five members, clothing it with any or all the powers of the committee.

COUNTY CODE ADMINISTRATION BOARD

The County Code Administration Board shall be composed of the Chairman, the Vice-Chairman, the Secretary, the Treasurer, and the Subdivisional Directors of this organization. The Chairman of this organization shall be Chairman of the Board; the Vice-Chairman of this organization shall be Vice-Chairman of the Board. The Secretary of this organization shall be secretary of the Board; and the Treasurer of this organization shall be Treasurer of the Board.

TRADE PRACTICE COMPLAINTS COMMITTEE

The County Trade Practice Complaints Committee shall be made up of the Chairman, the Vice-Chairman, the Secretary, and the Treasurer of the County Code Administration Board.

MEETINGS

Committee Meetings shall be at such times and places as are designated by the chairman.

Regular monthly meetings shall be held at the County office, unless otherwise specified, at the same specified time each month. They shall be opened to all paid up members of this organization and shall be combined meetings of all committees.

Special meetings may be called by the Chairman on five days' notice.

The Annual Meeting shall be on the second Wednesday before the State Meeting.

COUNTY OFFICE

The office of the Chairman shall be the County Office.

MAIL VOTES AND PROXIES

No mail votes shall be taken, and no proxies shall be recognized. But the chairman of any committee or board may take the vote of any member over the telephone, where an emergency makes time a vital element. But no such vote shall decide any question excepting by a majority vote of all committeemen or board members entitled to vote.

AMENDMENTS

These By-Laws may be amended at any time by submission of the proposed amendment by the officers of this Board to the respective Districts, and such amendment shall become effective if approved by seven Districts within thirty days after submission.

PAUL R. JORDAN, Secretary.

Boston, Mass.

Code compliance in the Metropolitan Boston area is being handled by the following men:

Pierce W. Murphy, Chairman.
R. E. Goho, Vice-Chairman.
Edward E. McGanty, Treasurer.
John F. Walsh, Executive Secretary.

The members of the Code Authority Committee for the Metropolitan Boston area, not serving as officers, are: William G. Kiefer, E. Van Noorden Co., and William Ormsby, Ormsby Roofing Co., both of Boston.

Rhode Island

The National Code Authority has approved the Code Administration Board for the Roofing and Sheet Metal Contracting Division of the Construction Industry for the State of Rhode Island.

The State of Rhode Island Code Administration Board consists of the following members:

Mr. Joseph McLaughlin, Chairman; representing the warm air heating division.

Mr. John Barnes, representing the re-roofing and residing division.

Mr. Edward J. Brunnckow, representing the sheet metal and slating division.

Mr. Howard Hart, representing the built-up roofing and waterproofing division.

Mr. Alfred C. Thompson, Executive Secretary of the Committee.

The Board is proceeding to function in its respective duties. Assessment notices received from the National Headquarters have been sent out to the Industry and work is underway to set up a Bid Depository and Trade Practice Complaints Committee as required under the Code.

Headquarters, centrally located, will ultimately be established to handle trade compliance complaints and fulfillment of the Code requirements.

ASSOCIATION Activities

New York State

The annual convention of the New York State Sheet Metal and Roofing Contractors' Association will be held in Hotel Seneca, Rochester, New York, April 8, 9 and 10.

The New York Association has been campaigning aggressively during the past year on the problem of mail order furnace competition. One entire day of the 1935 convention will be set aside for complete discussion of the mail order situation. An invitation has been extended to more than 200 furnace manufacturers inviting them or their representatives to attend the convention. It is hoped that this one-day session during the convention will thrash out many of the problems which have been confronting the entire industry, particularly the independent contractor.

In addition, the association wishes to extend an invitation to officers or delegates from all local, state or area associations to attend this convention for the purpose of co-operating with the New York Association and the manufacturers in solving the mail order problem.

Additional information on the program may be obtained by writing the secretary's office.

Adolph Hesse, Secretary.

◆

Chicago, Illinois

The Furnace & Sheet Metal Institute, Inc., recently elected officers for 1935. These officers are as follows:

Louis Drehobl, President.
M. L. De Wulf, Vice-President.
Clarence G. Rice, Secretary.
Peter Reif, Treasurer.

The code problem is still in the hands of our central committee though we expect a report from them at our next meeting.

Our educational program on warm air heating is making wonderful progress. We have enrolled many new members who are now taking the engineering course, and our attendance is very satisfactory.

Clarence G. Rice, Secretary.

◆

St. Louis, Mo.

The Sheet Metal, Air Conditioning and Heating Contractors Association of St. Louis are planning two meetings monthly, the second to be a social affair. This is to help create a friendlier feeling among the members. The committee hopes to increase the attendance and they plan to have some of the social meetings to include the ladies, the others to be stag affairs.

The David Ranken Jr. School of Mechanical Trades are having seven consecutive open Forum meetings on "Air Conditioning for Comfort." A large number of our members are taking advantage of these sessions.

—W. Cavallo,
Secretary.

DuPage County, Illinois

The DuPage County Warm Air Heating and Sheet Metal Contractors' Association wishes to report that quite a bit of progress has been made since the first of February in advancing the status of the proposed license law for furnace and sheet metal contractors operating in the State of Illinois.

The Fox River Valley Furnace & Sheet Metal Contractors' Association, the Sheet Metal Contractors' Association of Will County and the Sheet Metal Contractors' Association of La Salle and Peru have voted in favor of the proposed license law. The four members of the General Assembly from the 41st District have pledged to vote and support the proposed license bill.

It seems likely, therefore, that the association will soon have the backing of all active associations in Illinois as well as the support of many members of the state legislature.

Contractors interested in this law may obtain information by writing the secretary of the DuPage County Association.

Following is information pertaining to the proposed state license law for warm air heating contractors. This information is in answer to questions received since the law was written up in AMERICAN ARTISAN.

1. Why is this legislation proposed?

A. This legislation is proposed by the Du Page County Warm Air Heating & Sheet Metal Contractors Association as a means to protect the public from incompetent and itinerant persons who represent themselves as warm air heating contractors and to protect the industry from the ill-repute such persons have placed upon the industry in the past.

2. Do present members of the industry have to pass examination?

A. No. The proposed effective date is August 1st, 1935 and any person who prior to October 1st, apolies for a certificate and proves he has actively engaged in the business for one year prior to August 1st, shall be granted a certificate without examination upon application and payment of the fee. All persons applying after October 1st, shall be required to take examination.

3. Is air conditioning included?

A. Yes, as applied to the warm air heating system.

4. Should not the fee be a more nominal amount?

A. It is the opinion of all counsel that the fee as provided ($50.00) is such that a person will show serious intent of actively engaging in the industry, and that the fee will allow the industry to demand strict enforcement. All counsellors agreed that the fee is a consideration at the present moment, but believe the investment sound.

5. How will this Act be enforced?

A. The Act will be prosecuted in the particular county in which a violation may take place. Associations may cooperate with the states attorney of the county by citing and requesting enforcement. Where municipal laws require permits, the municipality also may cite and request action on the part of the states attorney. Enforcement can be prompt and strict if demanded by associations rather than individuals.

6. Does the law provide for inspections?

A. No. Municipalities should be encouraged to enact inspection legislation (permits) to thus determine compliance with the state law.

7. Does the proposed law supersede or repeal municipal license laws?

A. Yes. The certificate of registration is valid throughout the State of Illinois. See City of Chicago vs. Jensen 331-129, 162 N. E. 115.

8. Can municipalities enact licensing legislation **after** enactment of the state law and thus require two fees (state and municipal) on the part of the contractor?

A. No. By the fact that the certificate is valid throughout the state, municipalities can not invalidate the state law in any locality. Whenever municipal licenses have been enacted, supplementary to the state, explicit provision is made in the state law for such supporting legislation. In the case of liquor licensing, the state law makes municipal or county legislation mandatory. In the case of our proposal, supplementary legislation in the nature of local licensing is not provided.

9. Is the Standard Code incorporated?

A. The Standard Code for gravity and mechanical system, fire protective measures and other regulations will be adopted by the Department of Registration and Education.

10. Is the registration fee a yearly fee?

A. No. The renewal fee is one dollar each year.

11. Does the proposal prevent persons from performing their own work?

A. The Act applies only to contracting. Anyone can perform his own work. However, a contract being essentially an agreement between two persons, when two or more persons enter into an agreement to perform work defined in the proposed bill, the contractor must be licensed.

All persons in favor of the legislation should write the four members of the General Assembly at Springfield from their particular districts and voice their approval.

J. E. Peterson, Secretary.

◆

Brooklyn, New York

The Kings & Queens Counties Roofers' and Sheet Metal Contractors' Association are now holding a monthly meeting on the fourth Monday of each month. The place of meeting is 8 Nevins Street, Brooklyn, New York. The association has enjoyed consider-

Association Activities . . . .

able expansion during the last few months; now having 131 members. At the last meeting delegates to the Code hearing at Washington, D. C., and delegates to the United Roofing Contractors' Association convention at Chicago, Illinois, made their reports to the association.

The officers who are serving for 1935 are as follows:

G. E. Carlson, President.
J. Farbstein, Vice-President.
H. Hofstad, Treasurer.
John F. Grady, Jr., Secretary.
F. Devlin, Sergeant-at-Arms.
Directors: H. Baron, W. Marcus, R. Wolf, D. J. Thompson and W. Holt.

J. F. Grady, Jr., Secretary.

◆

Boston, Mass.

The Master Sheet Metal and Roofers' Association of Boston, Massachusetts, have elected their 1934 officers to serve again during 1935. These officers are:

Charles A. Earley, President.
Victor Shulman, Vice-President.
Frank L. Maguire, Treasurer.
John F. Walsh, Secretary.

Some progress has been made in organization work and it is anticipated that 1935 will be an active year for the association.

John F. Walsh, Secretary.

◆

Cleveland, Ohio

The Warm Air Furnace & Air-Conditioning League of Cleveland, Ohio, embraces the field of warm air furnace installers who have for years been wanting unity of thought, action, and a spirit of cooperation that would allow its membership to have the public confidence and recognition.

Through unity of thought the league expects to raise the craftsmanship standard and enter the field of winter air-conditioning, and standardize some of the industry's practices. The action of the league shall be directed by committees formed from its own membership. Jobbers and manufacturers are excluded from membership, but they are invited to attend its open forum lectures as they are conducted.

Committees, for problems of code authority and correction of such rulings contrary to the smooth operation of the industry, have been formed. Various other committees have been formed to handle other phases of the league's problems. Committees for schooling, education and welfare have been formed and are now functioning.

The league is conducting a school on air-conditioning which is being conducted by Eugene P. Farris, Research Engineer of The Emerson Electric Mfg. Co., St. Louis, Mo. The school committee meets with all the furnace manufacturers in this area, and their engineers, and friction from possible competitive influence has been eliminated by the furnace manufacturers themselves selecting Mr. Farris to be the instructor of the league's school.

A reference library for the league's use is being secured by stenotype copying of all these lectures so that the membership can have a complete record, in printed form, of all the data and facts given during this course.

The small handful of men who gave unselfishly of their time and effort to launch this, the largest and strongest group of furnace men in America, deserve unusual credit. The president, vice-president, secretary, treasurer, and the directors were elected to their respective offices as a token of esteem to their hard work and keen interest in the welfare of Cleveland's furnace dealers.

With a unified installation program, as applied to cold air returns alone, a million dollar business for Cleveland in 1935 is estimated. The potential market for air-conditioning equipment is estimated at another million for Cleveland in 1935. Appliances such as humidifiers, damper controls, thermostats, humidistats and other units, will, when they get rolling, pay the rents for the Main Street locations.

The Warm Air Furnace Industry with its new sister industry, Air-Conditioning has put new life into Cleveland. Inquiries to the league jobbers and dealers exceed 50 to 60 a day. One jobber alone reporting 27 inquiries on air-conditioning in one day. All reports to the contrary, that air-conditioning is wabbling on child's legs—Cleveland forges ahead as the pace-setter for America on air-conditioning, and all because of the unification of the furnace men into a league.

The consuming public of Cleveland is going to get the league's message on air-conditioning systems, and other of their offerings, through the Cleveland Electric League and large scale newspaper advertising that will cost the individual dealer only a small portion of its actual value, plus public addresses on various phases of the league's endeavor.

—D. A. Fisher,
Secretary.

◆

Fort Wayne, Indiana

The Sheet Metal & Warm Air Heating Contractors' Association of Fort Wayne, Indiana, recently elected the following men to serve as officers for 1935:

J. W. Loney, President.
Wm. C. Huguenard, Vice-President.
Eddie Granlund, Secretary.
John C. Kreidt, Treasurer.

Trustees: A. P. Pequignot (one year); Carl Miller (two years); C. L. Schust (three years).

Code matters were discussed at the last meeting as well as payment of assessments. The report of the officers showed an increase of almost 100 per cent in membership during 1934.

The code is actually being enforced in this district. We have been successful in eliminating the carpenter in the application of asphalt shingles.

After adjournment the entertainment committee served beer, mashed potatoes, sausage and saurkraut.

The new official staff has a number of new activities in mind for the new year, including a closer co-operation with the ladies and children of the members.

Eddie Granlund, Secretary.

◆

Buffalo, N. Y.

The Buffalo Sheet Metal, Warm Air Heating and Air Conditioning Association held its regular monthly meeting at the Hotel Markeen. Officers installed for the year 1935 were:

Leo J. Olear—President.
Wm. Gorden—Vice-President
N. Adema—Treasurer.
Fred Frisch—Sec.
N. Pilkey—Fin. Sec.
Frank Heck—Sergeant-at-Arms.

Board of Directors

Wm. Eisle.
Frank Minet.
Charles Hall.
Max Reid.
Elmer Weigel.

This Association has held a warm air heating school, conducted by Wm. Leghthard, Heating Engineer of the Furblo Blower Co. A very large group of heating contractors have attended this school.

The program outlined at this school, or heating course, was as follows: Gravity, Forced Air Heating, Air Conditioning.

These heating courses will be held the first Friday of each month after our regular meeting. The aim is to help the warm air heating trade in estimating on heating jobs to arrive at a more equal price.

In regard to the Code, we plan to cooperate with the code administrators in all things that we deem fair. We shall oppose unfair obligations imposed upon us unless we are given due consideration. We do believe that cooperation with the code authorities will tend to unify the industry.

Our committees are working very hard to have the Standard Code placed in our City Building Laws; also licensing all warm air heating contractors, with job inspection.

This association goes on record, after a long and hard battle with the coal and coke companies, as having stopped them from cleaning and repairing furnaces.

We feel that their business is selling coal and coke.

We wish to announce our success with the largest coal and coke companies here in Buffalo. They will cooperate with our association and turn all their work over to our members.

—Leo J. Olear, President.

◆

Fox Valley, Ill.

The Fox Valley Furnace and Sheet Metal Contractors Association will sponsor an open meeting featuring Professor S. Konzo of the University of Illinois as speaker.

Professor Konzo, with the aid of slides, will speak on the subjects of "Mechanical Warm Air Heating" and "Summer Cooling with the Aid of Furnace Fans and Attic Ventilation."

This will be a dinner meeting, held in the dining room of the Masonic Temple, corner of Benton Street and Lincoln Avenue, Aurora, Illinois, on Friday evening, April 12, at 6:30 o'clock. Ticket $1.00, including dinner and meeting. Reservation by April 6th.

Contractors are so well acquainted with the accomplishments, ability and background of Professor Konzo that we need not speak of them. We feel that the furnace contractors of the central west are fortunate in having the opportunity to listen to this informal discussion by Professor Konzo. He has stated that he will be glad to devote a small part of his time to answering questions.

—Jack Stowell, President.

Letters From Readers

Beg Your Pardon!

In the report of the Wisconsin State convention, published in the February issue of AMERICAN ARTISAN, in giving the address of Mr. Samuel of the Apollo Company, La Salle, Illinois, the statement was made that Apollo Chrom Metals were recommended by Mr. Samuel for interior but not exterior use. We regret this misstatement of fact and are pleased to advise that Apollo, copper base, Chrom Metal can be used on all types of exterior work. This particular type of exterior metal was used extensively on the Ford Building at the Chicago Century of Progress. Many other exterior applications of Apollo Chrom Copper are in evidence around the country.

◆

More Grates

American Artisan:

Further on the discussion on what burns out grates. One reader wrote me that he still believes ashes burn out a grate. I asked him if 4 or 5 inches of ashes on the grate prevents attaining a hot fire and if these ashes drop in the ash pit, how do you expect to make fire hot enough to melt the grate with ashes against the grate and no air getting to the fuel.

He claims ashes do not chill and many times the fire department is called to put out fires in basements. This is new to most people. Ash is dust; no heat there.

Small drops of slag (the size of small shot and even as large as a match head) drop in the pit and cool off. Take a red hot clinker out of a heater and see how soon it cools. All clinkers are on the grate unless you try to grind them through the grate; then you get hot coals in the ash pit. These thrown around start fires; not ashes.

Here is another thing I learned more than 35 years ago. A paper carton with top and bottom **cut out** and put on a floor register will give you fine results. Try it.

This carton detours cold air going to the register and the cold air on the floor does not get a chance to mix with the warm air as it comes out of the registers. When burning leaves you will notice the cold air coming from the ground and rushing against the fire. Have you ever thought this same thing happens to a floor register?

The register manufacturer who will make a wall register so the warm air comes into the room about 8 to 12 inches above the floor will solve a problem. About 5 years ago I was called in to change a warm air register on one of our jobs. Cold air from upstairs, also cold air from the kitchen door went over the warm air registers to get to the cold air faces. House would not heat in cold weather. The owner had a shield over all three warm air registers. All I did was to take his shields to the shop and add a solid bottom 8 inches high and throw the warm air into the room 8 inches off the floor. His house heats now in the coldest weather.

Again, if your supply of cold air is not large enough to supply all registers this will prevent any register from becoming a cold air face. If you throw a rug on the cold air face you compel long pipes to furnish the cold air and the short pipes to furnish the hot air. This I discovered in 1891.

If you have a wide baseboard register make a shield about 10 inches wide, 12 to 14 inches high and as long as the register is wide. For first floor base register and for second floor wall register have the shields extend about 6 to 8 inches from the wall.

These keep the cold air from the register and throw the warm air into the room about 12 inches above the floor. Registers that never did work will give you warm air after the pipes get hot.

Here is another since 1891. You cannot heat a house right with inside cold air and an open fireplace. The chimney draws so much air from the room that you cannot get enough cold air into the house around the doors and windows so the furnace cannot get the air it needs. Drawing in so much cold air helps to cool the house.

A very small per cent of houses with warm air furnaces are heated satisfactorily; they are either too cold or too hot. When standing up you are warm; when you sit down you are cold; not enough warm air going through the pipes to keep the house filled with warm air. Some take cold air from basements. The only cold air they get is from around the windows and doors.

Frank E. Hess.

Thanks and Good Luck

American Artisan:

Enclosed find my subscription check for American Artisan. I have been a subscriber for over 40 years and feel that I cannot be without it.

On November 27, 1933, I was stricken with paralysis and have not been able to work since, although I am at present somewhat improved. I can now be up and around the house. My business is still going along—I'm still furnishing patterns for metal boats.

H. F. Thompson,
Decorah, Iowa.

◆

American Artisan:

I received your letter with the enclosed card. This carries me back to the summer of 1895 when I chanced to get a copy of the American Artisan and read it on the train one evening while summer commuting. I was building a small home and had already provided a base burner to heat it; but I saw the advertisement of a furnace, of Schill Bros. Co., Crestline, Ohio. I corresponded with the firm and ordered a furnace. I knew nothing about furnaces, but my brother who was mechanically inclined, installed the furnace in 2 or 3 evenings. The neighbors wanted furnaces and I ordered them, so the American Artisan put me in the furnace business which I have steadily followed since.

A. Tillman Jones,
Nashville, Tenn.

◆

Kroeker Charts

American Artisan:

Regarding the Chart of Temperature Drop, we wish to state that this chart was of great interest to us and was used to a great advantage. We would also like to see this type of article continued in your magazine — American Artisan.

Sullivan Brothers & Lent, Inc.,
Binghamton, N. Y.

◆

American Artisan:

I would like to receive the Temperature Drop Chart as shown on page 33 of the November issue of American Artisan.

This is one of the "bugs" in forced air heating and while I have been using my own judgment as to what the drop might be, I am glad to know that this problem has been worked out.

How do you apply this to a new house under construction where you do not know the basement temperature?

Arden B. Smith,
Norristown, Pa.

LIBERTY

Manufacturers of a full line of cast iron furnaces and steel furnaces

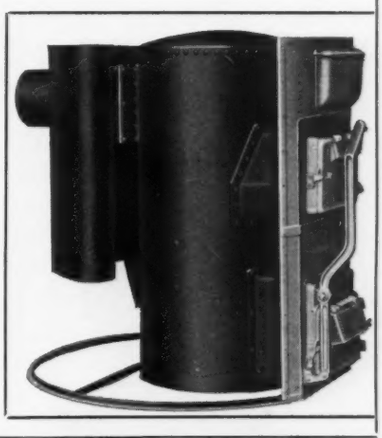
● Dealers are invited to ask for Liberty's Dealer Proposition showing wherein this dual line gives them a competitive edge.

MELLOW

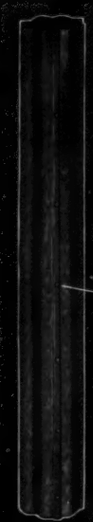
Every part of the MELLOW Furnace has been designed to make it the most efficient heating system. Castings from special analysis iron make for long life and eliminate danger of cracking and burnouts. One-piece radiator prevents leakage. Greater heating radiation is provided by heavily corrugated combustion chamber. Duplex Grate. The one-piece base ring facilitates installation of furnace.

FRONT RANK

Where a heavy, yet economical, steel furnace is required, the FRONT RANK CRESCENT meets the need every time. The drum and head are of 3/16 inch boiler plate, riveted and welded. Radiator is large, made of 12 gauge copper bearing steel and welded. Grate is roller bearing mounted.



LIBERTY FOUNDRY CO.
ST. LOUIS, MISSOURI



"BB"
The Mark of Quality

Seam Locked Every Few Inches

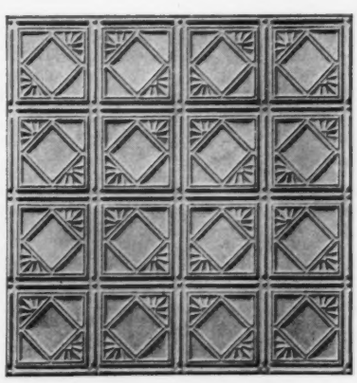
"Shur-Lock" Pipe

BERGER BROTHERS CO.
229-237 Arch Street, Philadelphia, Pa.

EAVES TROUGH
GUTTER HANGERS
CONDUCTOR FASTENERS
MITRES
END PIECES AND CAPS
CONDUCTOR HEADS
ORNAMENTAL STRAPS
VENTILATORS, ETC.

Write for catalog of the "BB" Line
Buy from your jobber

MORE STEEL CEILINGS ARE BEING INSTALLED



Are you getting your share of these installations? The trend of the times is toward the modern . . . and a really modern interior should have a steel ceiling. Clean . . . Safe . . . Economical and Attractive, Canton Steel Ceilings are without a doubt the finest on today's market . . . and wide-awake sheet metal contractors are reaping a goodly profit from their installations. Go after this steel ceiling business . . . there is plenty in your town . . . and remember . . . when ordering specify Canton Steel Ceilings . . . they assure you of superior quality and increased profits.

Sold through leading sheet metal jobbers

CANTON STEEL CEILING CO.
CANTON, OHIO Warehouse Service: 497 W. St., New York, N. Y.

New PRODUCTS

For your convenience a number has been assigned each item on this page. A coupon will be found on page 75. Check the items you are interested in and mail the coupon to us. Complete information will be forwarded.

111—Pressure Controls

Minneapolis-Honeywell announces a static pressure regulator designed for applications requiring accurate control of low pressures which normally do not exceed one inch of water above or below atmospheric pressure.

These static pressure controls employ an inverted bell with liquid seal as a contact actuating means. A push rod integral with the inverted bell ex-

tends upward through the top of the cast bell-and-liquid housing into the head of the control where, through a simple lever mechanism, the movement of the bell, effected by pressure variation, is transmitted to the control contacts.

They may be used (1) as a positive or static pressure controller (2) as a sub-atmospheric or "draft" controller or (3) as a differential controller.

◆

112—Conditioner

A room type air conditioning unit, to sell at a low price is now in production by Chrysler Motors. The new unit performs all functions of air conditioning in both summer and winter when connected to a refrigeration and heating source.

Chrysler will now manufacture for Airtemp, Inc., a complete line of air conditioning equipment, from the low-priced unit, to special systems for large hotels and commercial establishments.

The company also announces a new half-ton self-contained air conditioning unit to sell at the lowest price ever placed on an air conditioning product of this capacity. This self-contained unit needs only electrical and plumbing connections to operate.

113—Pyrometer Lance

Russell Electric Company, 342 W. Huron St., Chicago, is offering a pyrometer of the Lance type. The sales price includes complete equipment with the exception of the thermocouples. Meters are available for

three different temperature ranges of 800-1600-2500° F. The instruments are of the low resistance type, combining high accuracy in combination with rugged construction.

These portable hand instruments can be used for checking temperatures in all the applications where a wall type pyrometer is used, such as an exploring instrument to gather heat data in chemical and industrial processes.

◆

114—Spray Nozzle

A self-cleaning nozzle for use on water supply lines for air conditioning and humidifying apparatus is announced by Detroit Lubricator Company, Detroit, Michigan. The new nozzle is designed to take advantage

of the intermittent operation of the water supply to provide an automatic cleaning or "reaming out" of the orifice with each opening and closing of the control valve. As shown in the sketch, the body of the nozzle is brass. A stainless steel diaphragm supports a movable orifice through which the fixed plunger or needle projects when the water supply is closed and the diaphragm is in its closed position. In operation, when the supply is opened, water passes through the strainer, forces the diaphragm outward, moving the movable orifice away from the fixed needle. This open the port and water is forced in a stream through the orifice. When the water supply is closed, pressure on the diaphragm is released and the spring returns the diaphragm to its closed position. Each movement of the diaphragm results in a cleaning operation by forcing the needle out and back through the orifice.

◆

115—New Furnace

Rudy Furnace Co., Dowagiac, Mich., has announced for 1935 a new line of solid fuel, cast iron furnaces incorporating a modern front design and a variety of advanced engineering features. Temporarily the new line will consist of 20-, 22- and 24-inch firepot sizes. Other sizes are to be added later. The line is known as company's "A" series and is competitively priced.

The company's old line is termed the "B" series and price reductions have been made on it.

Among the "A" line's features are full-floating, modernly designed, slip-over fronts so constructed as to be airtight when used with blowers; one-piece, even-thickness, adjustable radiators; a new type of soot burner; porcelain-lined, kidney waterpan which swings outside the casing for filling and cleaning; an improved type of casing draw lugs; automatic air accelerators; adjustable door hinges; an improved grate assembly.

Michigan Convention

(*Continued from page 22*)

by the speaker as very essential and the next move which should be made by associations. In answer to a question as to whether or not jobbers are necessary in this industry, Mr. Frazee declared that he believes jobbers are important because most jobbers render a very definite and valuable service. Manufacturers used to think that the jobber was not entitled to the discounts which he obtained, but many manufacturers have found that sales costs by direct representatives are often higher than sales through jobbers and that the warehousing service extended by jobbers is highly important in many sections of the country.

Mr. Frazee presented some interesting results obtained by his company in their attempt to find out just what constituted good sales methods. Mr. Frazee declared that his investigation disclosed that price leaders were one of the best methods for bringing customers into a store or getting inquiries. In most cases these price leaders are not sold because they are generally small sized furnaces. House-to-house canvassing is still a good sales method, but the call should be made at the back door rather than the front door.

OFFICERS

President—W. W. Busch, Detroit.
Vice-President—Peter Wierenga, Grand Rapids.
Treasurer—Homer Brundage, Kalamazoo.
Secretary—Frank Ederle, Grand Rapids.

DIRECTORS

John Bos, Muskegon.
John Clarke, Detroit.
W. H. McBratnie, Saginaw.
Tom Marshall, Detroit.
John F. Erhardt, Grand Rapids.
Jas. Hage, Lansing.

W. C. Markle, secretary-treasurer of the National Code Authority, spoke on the subject "The Roofing and Sheet Metal Code." Mr. Markle briefly described some of the things which are being done at the present time or are in process of completion. A meeting is to be held on the advisability of having a common local bid depository for all sections of the basic construction industry. In answer to a question Mr. Markle said that bid depositories are not compulsory but are strongly recommended by the Construction Code.

Amendment X-36, which has been before NRA since August, 1934, declared Mr. Markle, is now settled by an order signed March 4 requiring everyone doing sheet metal and furnace work to pay into our Code. There are no ex-

(*Continued on page 71*)

Man! What a Furnace!

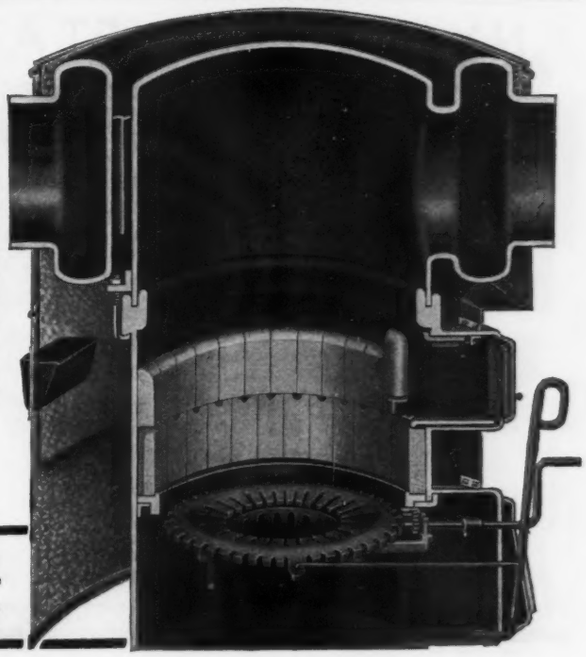
Made of Fire-Box Steel--Joints Double Arc Welded--Body Streamlined -- Double Size Radiator -- *Today's Finest Heater*

Any furnace man who examines the view at the right will readily appreciate the remarkable superiorities of design incorporated in the U. S. STEEL FURNACE. What a heater this is! Just think! It provides 35-50% faster circulation of air—supplies a far greater volume of heat—yet uses substantially less fuel.

Note the straight-sided, *streamlined* body, the massive radiator completely encircling combustion chamber and *separated* to permit free flow of air between radiator and chamber. Note the complete absence of cemented joints. Note the extra size of the combustion chamber itself.

These are features vitally important to more efficient heating—features that make it easy for the U. S. Dealer to beat competition and secure a profitable volume of sales. Write today for the U. S. Dealer Proposition.

You can order your U. S. floor samples now and have until next July to pay for them! Here is the most liberal dealer offer we have ever made. Take advantage of it! Let us carry the investment while you make the sales. You can make your floor samples pay for themselves many times over, if you start now, pushing this remarkably fine home heating plant.



U. S. PRESSED STEEL PRODUCTS CO.
KALAMAZOO MICHIGAN

1935 Code Budget — (*Continued from page* 16)

AREA		BUDGET ITEMS						
7 Tennessee								
	Nashville	4,800	1,080	300	510	600	7,290	3/4
	Knoxville	4,800	1,080	300	510	600	7,290	3/4
	Memphis	4,800	1,080	300	510	600	7,290	3/4
	Chattanooga	4,800	1,080	300	510	600	7,290	3/4
Florida		4,890	960	4,500	277.50	2,000	12,627.50	3/4
Georgia		4,200	760	1,200	310	2,470	8,940	3/4
Alabama		6,000	1,800	1,500	400	300	10,000	3/4
							$60,727.50	
8 Kentucky		4,600	1,600	1,800	1,000	1,000	10,000	1/2
Indiana		3,730	3,860	3,100	310	1,000	12,000	1/2
	Indianapolis	1,265	735	500	200	300	3,000	1/2
	Ft. Wayne (Dis. 1)	1,200	900	800	300	200	3,400	1/2
Illinois		8,600	3,500	3,000	2,000	2,900	20,000	1/2
	Cook County	18,000	7,260	3,000	2,540	4,200	35,000	3/10
	Wheaton	250	210	240	....	200	900	1/2
	Quad. Cities (Ill. & Iowa)	360	156	60	24	....	600	1/2
Iowa		5,400	3,000	2,000	1,600	3,000	15,000	1/2
Minnesota		9,200	4,900	2,200	1,700	2,000	20,000	1/2
Wisconsin		6,000	2,500	2,300	1,800	2,400	15,000	1/2
							$134,900	
9 Missouri		1,500	1,500	1,500	300	200	5,000	3/4
	St. Louis	3,000	3,000	3,000	600	400	10,000	1/2
Kansas		1,500	560	600	440	400	3,500	3/4
	Kansas City	1,040	1,142	....	100	....	2,282	1/2
	4 Boards	2,500	2,200	800	1,000	1,000	7,500	3/4
Nebraska		4,600	1,600	1,800	1,000	1,000	10,000	3/4
South Dakota		4,000	1,400	1,600	500	500	8,000	3/4
North Dakota		4,000	1,400	1,600	500	500	8,000	3/4
Montana		1,200	1,000	1,000	200	100	3,500	3/4
Wyoming		600	400	800	100	100	2,000	3/4
Colorado		3,600	840	1,080	280	200	6,000	3/4
							$65,782	

SO OFTEN A COPPER JOB MEETS ALL NEEDS MUCH BETTER THAN ANY OTHER METAL

HUSSEY

Aside from its many advantages which make a copper job a sounder recommendation by the metal contractor, copper itself has a strong sentimental appeal to the buyer.

Copper means value—we use it as money. Copper means beauty—we make many of our most cherished ornaments from it.

Yet you can figure a job in copper as against other metals, and by all standards it will prove to be the best buy in the end. When contractor and owner agree on copper, there are important savings for the owner and bigger profits for the contractor.

Suggest copper on jobs that would be better if it were used, and note how the owner warms up to the suggestion.

Whatever your requirements in copper may be, Hussey can supply it—quick delivery from mill and all warehouses.

DISTRICT SALES OFFICES

BALTIMORE, BUFFALO, CHICAGO, CINCINNATI, CLEVELAND, ST. LOUIS, NEW YORK, PHILADELPHIA, PITTSBURGH

WAREHOUSES

CHICAGO, CINCINNATI, NEW YORK, CLEVELAND, ST. LOUIS, PHILADELPHIA, PITTSBURGH

MILLS AND EXECUTIVE OFFICE

PITTSBURGH

C. G. HUSSEY & COMPANY
PITTSBURGH, PENNSYLVANIA

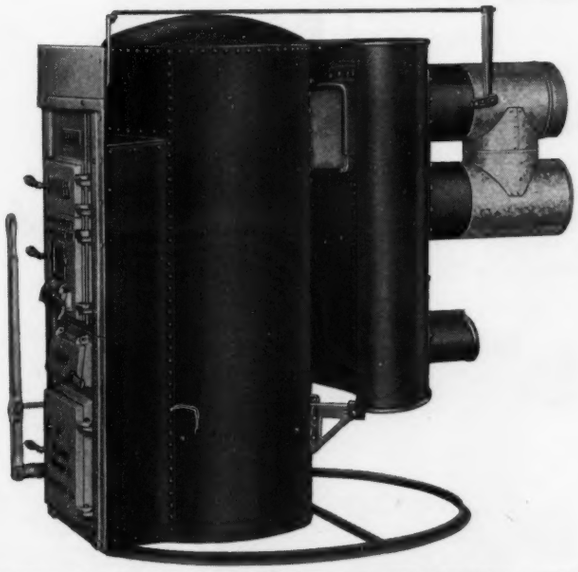
	AREA		BUDGET ITEMS						
10	Oklahoma		2,000	400	1,000	400	400	4,200	1/2
		Oklahoma City	1,500	600	600	100	200	3,000	1/2
		Tulsa	1,500	600	600	100	200	3,000	1/2
		McAlester	300	150	50	....	....	500	1/2
		Enid	300	150	50	....	....	500	1/2
		Lawton	300	150	50	....	....	500	1/2
		Muskogee	300	150	50	....	....	500	1/2
	Louisiana		2,000	400	1,000	400	400	4,200	1/2
	(Sheet Metal)	New Orleans	2,480	820	800	100	500	4,700	1/2
	(Roofing)	New Orleans	2,480	820	800	100	500	4,700	1/2
		Shreveport	400	500	300	....	300	1,500	1/2
		Alexandria	300	150	50	....	....	500	1/2
		Opelousas	300	150	50	....	....	500	1/2
		Monroe	300	150	50	....	....	500	1/2
		Lake Charles	300	150	50	....	....	500	1/2
	Arkansas		2,000	400	1,000	400	400	4,200	1/2
		Little Rock	1,500	600	600	100	200	3,000	1/2
		Texarkana	300	150	50	....	....	500	1/2
		Fort Smith	300	150	50	....	....	500	1/2
		Conway	300	150	50	....	....	500	1/2
		Hot Springs	300	150	50	....	....	500	1/2
		Helena	300	150	50	....	....	500	1/2
		Camden	300	150	....	....	....	500	1/2
	New Mexico		2,000	400	1,000	400	400	4,200	1/2
		Albuquerque	400	500	300	....	300	1,500	1/2
		Santa Fe	300	150	50	....	....	500	1/2
		Carlsbad	300	150	50	....	....	500	1/2
		Roswell	300	150	50	....	....	500	1/2
		Gallup	300	150	50	....	....	500	1/2
	Arizona		2,000	400	1,000	400	400	4,200	1/2
		Phoenix	400	500	300	....	300	1,500	1/2
		Tuscon	300	150	50	....	....	500	1/2
	Texas		3,680	800	1,200	300	700	6,680	1/2
	(Roofing)	Fort Worth	1,500	600	600	100	200	3,000	1/2
	(Sheet Metal)	Fort Worth	1,500	600	600	100	200	3,000	1/2
	(Roofing)	Dallas	2,480	820	800	100	500	4,700	1/2
	(Sheet Metal)	Dallas	2,480	820	800	100	500	4,700	1/2
		Austin	400	500	300	100	200	1,500	1/2
		Waco	400	500	300	100	200	1,500	1/2
		Tyler	400	500	300	100	200	1,500	1/2
		Wichita Falls	400	500	300	100	200	1,500	1/2
		Amarillo	300	150	50	....	....	500	1/2
		Sherman	300	150	50	....	....	500	1/2

THE NEW PEERLESS profit producer

MODEL "A" SERIES WARM AIR FURNACE

with a

GUARANTEE FOR A LIFETIME OF SERVICE



Here is a furnace, newly developed, that will give your customers the utmost in value. Built of the finest materials, by an organization of master furnace craftsmen, and incorporating many exclusive features such as a new patented Automatic Damper Control, a special formula Firebrick, and others too numerous to mention . . . this New Peerless Model "A" Furnace offers you unlimited sales opportunity. Get in the swim with Peerless Products for this year's business . . . you will find that they will not only build your profits, but produce a complete list of satisfied customers.

Write today for complete literature and details of the new lifetime guarantee.

WE DO NOT SOLICIT BUSINESS FROM, OR SELL TO MAIL ORDER HOUSES

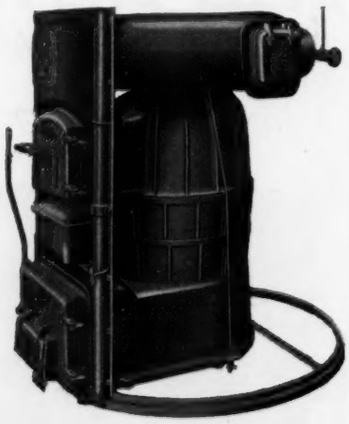
THE PEERLESS FOUNDRY CO., INC.

INDIANAPOLIS INDIANA

	AREA		BUDGET ITEMS						
	Texas—(Cont.)	El Paso	300	150	50	....	....	500	1/2
		Laredo	300	150	50	....	....	500	1/2
		Abilene	300	150	50	....	....	500	1/2
		Lubbock	300	150	50	....	....	500	1/2
		San Angelo	300	150	50	....	....	500	1/2
		Beeville	300	150	50	....	....	500	1/2
		Galveston	300	150	50	....	....	500	1/2
		Corpus Christi	300	150	50	....	....	500	1/2
								$86,480	
11	California	San Joaquin Valley	....	....	....	....	1,350	1,350	3/4
	(Sheet Metal)	San Diego County	900	126	120	12	....	1,158	3/4
	(Roofers)	San Diego County	1,500	780	420	120	....	2,820	3/4
	(Sheet Metal)	San Francisco	5,460	960	300	480	600	7,800	3/4
	(Roofers)	San Francisco	2,700	540	360	....	....	3,600	3/4
	(Roofers)	Orange County	1,000	300	180	120	200	1,800	3/4
		Harbor Area	2,325	528	120	30	....	3,003	3/4
		E. Bay Counties	2,400	1,260	300	240	300	4,500	3/4
	*(Sheet Metal)	Orange County	....	....	....	....	300	300	3/4
		Central California	900	270	60	....	120	1,350	3/4
		San Gabriel Valley	2,400	960	240	100	200	3,900	3/4
		Northern California	6,600	1,320	1,800	500	1,000	11,220	3/4
		Los Angeles County	3,900	1,080	600	250	500	6,330	3/4
		Riverside and San Bernardino	600	540	240	60	60	1,500	3/4
		Met. Los Angeles	6,600	2,040	300	360	300	9,600	3/4
	*(Roofers)	Sacramento Valley	1,110	300	120	150	120	1,800	3/4
		Tri Counties	300	104	175	100	200	879	3/4
	Washington	Tacoma	3,180	960	1,200	240	300	5,880	3/4
		Western District	900	480	900	120	....	2,400	3/4
		Seattle Division	5,160	1,560	1,620	300	300	8,940	3/4
		Spokane Division	2,880	1,800	1,440	180	300	6,600	3/4
		Eastern District	420	390	600	60	....	1,470	3/4
		Everett Division	120	96	120	60	....	396	3/4
		Grays Harbor	240	180	....	180	....	600	3/4
	*	Bellingham Division	144	192	180	48	36	600	3/4
	Oregon		4,980	1,620	1,200	520	500	8,820	3/4
	Idaho		1,500	1,500	1,500	300	200	5,000	3/4
	Nevada		1,200	450	120	120	300	2,190	3/4
	Utah (Sheet Metal)		2,850	850	500	350	500	5,050	3/4
	Utah (Roofers)		1,200	100	100	50	....	1,450	3/4
								$112,306	

*Not in original Exhibit D. Just approved January 24, 1935.

This Husky Team from ROUND OAK Will Help You Cash in on Spring Furnace Business



Spring is bringing with it prospects for new furnace installations, and remodeling jobs . . prospects of good business for the dealer handling the famous ROUND OAK line of cast and steel furnaces. From coast to coast, the name ROUND OAK stands for quality and dependability. To the dealer, the name ROUND OAK is a valuable asset that assures more furnace sales, and better satisfied customers.

ROUND OAK offers a complete line of cast iron and steel furnaces, also air conditioners, designed and priced to meet the requirements of today's market. Write NOW for the interesting ROUND OAK proposition.

DISTRIBUTORS

Sioux Falls Corrugating Co., Sioux Falls, S. Dak.

Waterloo Metal and Mfg. Co., Waterloo, Iowa.

Haw Hardware Company Ottumwa, Iowa

The MacIntyre Company Fond du Lac, Wis.

Wm. Dutton & Sons Co. Hastings, Neb.

Sam H. Kimbler Denver, Colo.

Above—The "Blended-Iron"

The only furnace with patented diamond-shaped radiator, specially designed water pan, patented rod construction and many other features which make it the standard of comparison among cast iron furnaces.

At Left—The "Moist-air Boiler-Plate"

Seamless electric arc-welded unit construction. Machined milled feed and ash pit doors. Special easy operating duplex grate. Only one joint, double cemented tongue and groove type, bolted permanently gas-tight.

ROUND OAK COMPANY

Stoves—Ranges—Furnaces—Air Conditioners

Dowagiac Since 1871 Michigan

Metal Man's Sign

(*Continued from page* 20)

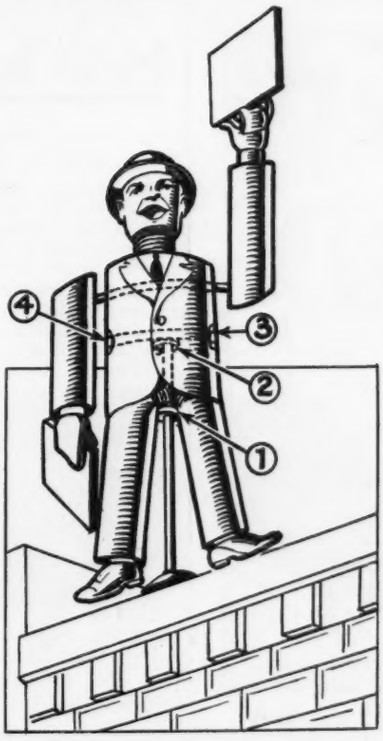
The eyes are counter-balanced as are the tongue and teeth so the movement of the head causes them to move and flash.

The weather vane has a dirigible patterned from a photograph of the Graf Zeppelin and made practically to scale.

Hanging at the ends of cross bars also are parachutes and airplanes. The airplanes have little sheet metal pilots in them and the parachutes are so constructed that they catch the wind and make the vane revolve.

Contrasted with these modern devices is a model of the flagship of Columbus patterned quite accurately as to scale. An old fashioned locomotive with a flaring smokestack is also under consideration while the model of an automobile will be added later.

Mr. Strain has a brilliant sign out in front and yet he steals the light for it at night. His name is made of mirrors, the sections of glass being set at angles to catch the light from across the street and from the passing automobiles.



This sketch shows the construction of the "drummer." Numbers refer to points of construction discussed

The mirror sign sits, as indicated in the photo, not flush with the face of the building, but broad-angle, V-shaped. The name, "W. H. Strain," not only sits at an angle as indicated but also is tilted out slightly at the top, about 10 degrees away from perpendicular. This is done purposely to catch the rays of the sign across the street. The letters in the name are made of mirror held against a sheet metal back by little side clamps. The angle at which the name tilts allows the mirror to pick up and reflect light from passing automobiles as well as from the Neon sign across the way.

"Western Avenue," says Mr. Strain, "is a street with plenty of automobile traffic but not a great deal of foot traffic. It is a through street and drivers go at a good pace.

"I would say that the traveling man with his gesticulating arms and his flashing eyes and teeth causes a greater number of people to stop than does the weather vane, but after they stop the weather vane holds them longer."

YOU ARE INTERESTED
in
A PLAN TO INCREASE YOUR SALES

that will work with your set-up in business. We have it and it actually works. . . . The plan has been developed through actual practice and is past the point of theory.

The Grand Rapids Furnace Cleaner is powerful, portable, and reasonably priced. Hard usage in the field has proven it to be durable.

OUR FREE TRIAL OFFER... with no strings attached—will prove these statements to you.

YOU ARE THE JUDGE . . .

and then if you like the machine and our plan works for you—purchase can be arranged on—

CONVENIENT TERMS.

Write for details.

GRAND RAPIDS FURNACE CLEANER CO.
Grand Rapids, Michigan

WARM AIR FURNACES
FURNACE FITTINGS
FURNACE PIPE
REGISTERS
FILTERS
FANS
BLOWERS
CONTROLS

A DEPENDABLE SOURCE OF SUPPLY

THE J. M. & L. A.
OSBORN Co
Manufacturers—Distributors
DETROIT-CLEVELAND-BUFFALO

Whether you make money in 1935 depends entirely on you. You will succeed if you realize that a furnace must be sold before it is installed. The reward goes to the salesman, not to the installer.

Your selling efforts will be made easier and more profitable if you take on the Moncrief line. Moncrief Furnaces and Air Conditioning Systems are up to the minute, bristling with good features, and priced so you can get business.

Write today for information on the new items which make the Moncrief line more complete, more attractive than ever.

The Henry Foundry & Furnace Co.
3473 E. 49th St. Cleveland, Ohio

Manufacturers of

MONCRIEF FURNACES

AND AIR CONDITIONING SYSTEMS

Sectional view Series "C" Cast Furnace

News Items . . . . . .

Death of James M. Triggs

James M. Triggs, president of the Majestic Company, Huntington, Indiana, died of heart disease February 17. Mr. Triggs was sixty-four years old. As a youth he entered the employ of the Majestic Company and held many positions until he was made president. Mr. Triggs, himself, always liked to refer to his business life as "having grown up in the furnace business." He liked to recall his days when as a small boy his chief task was to keep the wood bin filled with cord wood for the family stove. One day, according to the story, he and his brother read about a furnace which was placed in the basement and which heated the house from a single fire. The two boys bought an old boiler, laid it on its side and made a new end so that the fire door was in the end and not in the side. A brick casing was built around the boiler and from the top the two boys took warm air leads made of pipe in their father's store. Holes were left in the bottom of the brick casing so that cold air could enter the space between the brick wall and the boiler. This early system was revamped to include enclosed return air when Mr. Triggs read that the use of basement air was not advisable. Mr. Triggs' long period of service to the National Warm Air Heating and Air Conditioning Association ended in December, 1930 when he completed his term as president of the association.

Mr. Triggs is survived by Mrs. Triggs, a son and a sister.

◆

Contractor Makes "Iron Man"

James M. College, sheet metal contractor of Saint Albans, West Virginia, sends us a photograph of an all-metal man, manufactured in his own shop and used for advertising purposes.

The man is made out of Ingot iron and is thought to be the first iron man in the West Virginia area. Mr. College reports that he placed the iron man in his truck and made a trip to Charleston, West Virginia, eleven miles from Saint Albans, and that the man attracted a great deal of attention.

◆

E. Ludwig Buys Out Partner

E. Ludwig, 609 Columbia St., Ottawa, Illinois, announces that the firm of Hardten and Ludwig has been dissolved and that he will operate a furnace and sheet metal shop at the above address.

◆

Complete Big Ventilating Job in Record Time

One of the most rapidly completed ventilating jobs of recent months in Chicago was completed this winter by the Narowetz Heating & Ventilating Company, 1711 West Maypole Avenue, Chicago, in the new International Amphitheater at the Union Stock Yards. This is one of the largest buildings without columns in the country and replaces the old auditorium destroyed last year by fire. More than 46 tons of galvanized iron were required.

◆

Death of R. S. Walker

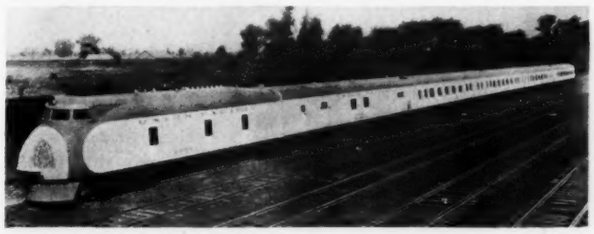
R. S. Walker, Credit Manager of the Round Oak Company, Dowagiac, Michigan, died suddenly on Saturday, February 9th. Mr. Walker had been identified with the Round Oak Company for many years.

News Items . . . . . .

Streamlined Train Air Conditioned

Passengers aboard the Union Pacific's high-speed streamliner as she streaked across the continent from Los Angeles to New York recently in 56 hours and 55 minutes, a world record for long distance rail travel, tasted the benefits of the greatest advance in indoor weather control man has yet accomplished.

For as the rail bullet shot eastward from the cool atmosphere of the coast into the hot temperatures of the region flanked by Death Valley and the Imperial Valley, then into the snow-capped area of the Continental Divide,



and down on to the prairies of the middle-west, the new-type air conditioning system designed and built by Frigidaire Division, General Motors Corporation, for Pullman Car and Manufacturing Company, builder of the train, swung back and forth from one season to another in a space of only a few hours.

The train has one of the most modern air conditioning systems used in railroad service. The system supplies the necessary cooling and dehumidification, or heating and humidification so that occupants may have the acme in travel comfort. All air is filtered to remove dust, dirt and pollen—removal of the latter being of major importance for travelers who may be suffering from certain types of hay fever or pollen asthma. The air conditioning system has what is known as "human-proof" control. It functions automatically and is not subject to the particular whims of a porter or train attendant, but operates according to outside weather conditions.

◆

Air Conditioning Show

Announcement is made of an air conditioning show sponsored by the National Society of Air Conditioning Engineers to be staged in the Merchandise Mart, Chicago, May 20 to 25 inclusive. This is the second show staged by this organization. The show is held in the interest and for the benefit of the entire air conditioning industry and not for profit. Any funds remaining after expenses are paid revert to the Chicago Chapter of the association. Space has been taken on the second floor of the Merchandise Mart and all the necessary publicity to popularize the show will be provided. Full information on spaces, prices of booths, and exhibit incidentals may be obtained by addressing the Show Committee, A. B. Coffman, Show Manager, Room 11-110 Merchandise Mart, Chicago, Illinois.

◆

E. P. Bailey Opens Engineering Office

Edward P. Bailey, Jr., announces the opening of an office in Cleveland as air conditioning consultant. His counsel covers market analysis, selection of equipment, merchandising programs for public utilities and sales-counsel to manufacturers.

On graduation, in 1912, from Sheffield Scientific School, Yale University, Mr. Bailey was employed by The Peoples Gas Light & Coke Co., Chicago, serving first in the manufacturing division, later as house-heating engineer.

In 1919, he joined the Bryant Heater & Mfg. Co., Cleveland, serving as assistant branch manager, sales manager, and president, 1919-1929. He was next connected with the National Radiator Corporation as general manager of its gas heating division. In 1933 he returned to Cleveland as vice-president in charge of operations of The Bryant Heater Co.

Mr. Bailey has been a member of the American Gas Association since 1922, and of the American Society of Heating and Ventilating Engineers since 1923. Under the NRA he is vice-chairman of the Gas Heating Boiler, Furnace, and Conversion Burner Institute.

it's GLOBE!

that's all you need know about Sheet Metal . . .

Buy all your sheet metal requirements the **safe** way—by the name GLOBE. When you use Globe Brand products you have positive assurance of guaranteed quality and finest workmanship—two outstanding advantages that give you a head start on your competitors.

Whatever you need in sheet metal you'll find under this famous trade-mark. Tie up with GLOBE for your own protection and profit.

Write for complete details of Globe Products for the Sheet Metal Industry.

GLOBE TRADE MARK BRAND

THE GLOBE IRON ROOFING & CORRUGATING COMPANY

CINCINNATI OHIO

GLOBE

SHEET METAL

BUILDING PRODUCTS

Convention Bound?

REMEMBER THE TRIP TO ARMCO

HEADIN' for the Roofing and Sheet Metal Industries Conference in Cincinnati? What a time you'll have, seeing, learning, hearing, and enjoying the hospitality of the city. And not the least will be the interesting trip through the Armco Mills in nearby Middletown.

ARMCO is a familiar-enough name to you. And it is a good host, too, as you shall see. Here the whole fascinating drama of rolling sheet metal continuously will unfold before your wondering eyes. It's an experience you'll always remember.

Consider this a cordial invitation to visit Armco's famous "East Works" plant during the big conference. Transportation will be arranged. Just join the crowd and say "here I am!" We'll be looking for you. Send your name now if you want to be sure you are included. Or, inquire at the Registration Desk when you arrive.

THE AMERICAN ROLLING MILL COMPANY

Executive Offices: Middletown, Ohio

News Items . . . . . .

Air Conditioning Short Course

The air conditioning short course to be held at Michigan State College, East Lansing, Michigan, Wednesday, Thursday and Friday, March 27, 28 and 29, has been announced previously.

The program for the short course has now been completed and will be as follows:

Wednesday

9 A. M.—Registration—"Be on time."
10-12 A. M.—Fundamentals of Heating—J. H. Van Alsburg.
1- 5 P. M.—Figuring Heat Loss on two rooms of Plan "A"—J. E. Maynard.
Evening—Figure balance of Plan "A"—by students.

Thursday

9-10 A. M.—Correct papers by exchange.
10-12 A. M.—Duct and Register layout—Lecture by F. R. Bishop.
1-5:30 P. M.—Lay out ducts on Plan "B"—Ed Root.
6:30 P. M.—Banquet.
Evening—Lay out ducts on Plan "A"—by students.

Friday

9 A. M.—Return all papers for grading.
9:15-12 A. M.—Laboratory demonstrations by Professor Reuling and B. McLouth.
1 P. M.—General discussion with written questions answered by the group, read by H. B. Derks.

The registration fee for this course is $2.00 covering both the annual banquet and the registration. Students are expected to bring an Architects's Scale 6 inches long or longer, and a notebook, preferably 8½x11 inches. Rooms can be had at college houses for $1.00 a night and meals at very reasonable rates.

Full information on the course or particulars relating to any part of the course, together with information on reservations, rooms, meals, etc., may be obtained from Professor L. G. Miller, Department of Mechanical Engineering, Michigan State College, East Lansing, Michigan.

◆

Baker, Belvidere, Ill., Awarded School Contract

News reports from Illinois state that the firm of F. F. Baker & Son, 131 North State Street, Belvidere, Illinois, have been awarded contracts with Anderson Brothers, general contractors of Gary, Indiana, for the fabrication and erection of the exterior sheet metal work on a new high school now being erected with PWA funds at Dunlap, Illinois. The report states that this is the second school contract awarded to Baker & Son Company within the last few months.

◆

Oil Burner Sales in 1934

According to the Bureau of Census, governmental agency for reporting sales of manufactured products, the oil burner industry, as represented by 149 manufacturers, sold 98,846 oil burners during 1934. This compares with the total of 83,130 in 1933.

◆

Contractor Buys Out Partner

C. Branham, who has just completed his term as president of the Indiana Sheet Metal, Warm Air Heating and Roofing Contractors' Association, announces that he has taken over the interest of his former partner, Bert Myers, and is now the sole owner of the Bloomington Radiator and Sheet Metal Works. Mr. Myers is no longer connected with the firm in any capacity.

◆

Loan for Furnace Made Speedily

The manager of a local branch of Federal Housing Administration reports what is probably a record time for the granting of a modernization or repair loan.

During a recent cold spell in San Francisco a home owner called at the bank at 3:40 o'clock and reported that his furnace had broken down completely and that it would be necessary for him to make a loan in order to repair or replace the furnace. The owner asked if he could obtain a loan under Title I of the FHA and asked how long it would require to put the loan through. The owner was advised at 3:55 o'clock that the money for the work was available.

News Items . . . . . .

Better Housing Meetings

A chain of meetings, offering contractors, architects, building supply dealers, and builders complete instructions on how to cooperate fully on the Better Housing Program of the Federal Housing Administration, has been organized in 33 key cities in the United States. The building industry itself is supplying speakers who are men of outstanding ability and performance. These recognized experts advise, inspire, and teach how to plan point-of-sale campaigns. All meetings are under the direct auspices of the local Better Housing Program committees which organize and assemble each group.

Among subjects presented by speakers and for round table discussion are: Better Selling of Better Housing, Educating the Women, Educating the Farmer, Modernizing Main Street, Use of Advertising in Sales, Selling Better Housing Door to Door.

This is how the plan will operate: Major meetings are being conducted in 33 key cities throughout the United

States. Expert speakers from industries address these meetings. Men who have succeeded tell in detail how they did it and what the results were in such a way that any other man may do the same thing in his own community.

Attending all key city meetings will be the local committee chairmen from every city of 10,000 population or over within each State.

Associate F. H. A. State Directors and their field men and bankers who are cooperating with the Federal Housing Administration will be present. When the key city meetings are over, it is the intent of the Federal Housing Administration that the local chairmen, many of whom are contractors and building supply dealers, go back to the local committees in their home cities and hold meetings in their own localities following in every detail the arrangement and conduct of the key city meetings.

◆

Certified Air Conditioning

Four organizations, the Chicago Master Steamfitters' Association, the Ventilating and Air Conditioning Contractors' Association of Chicago, the Western Society of Engineers and the Illinois Society of Architects, have joined to form a new organization, which will sponsor a movement to compile standards to be used in the installation of air conditioning systems. These standards are to be the result of a study of a committee composed of representatives from the first three of the organizations named.

The standards will define what complete air conditioning means and outline reasonable minimum requirements for temperature, air motion, moisture control and dust removal. The standards will also define the principal legal requirements and safety provisions for adequate installation. All proposed air conditioning installations must comply substantially with the proposed standards in order to be certified.

The four organizations are using a page of space in the current R. R. Donnelley classified telephone directory in Chicago announcing the formation of the association and giving some information about the standards.

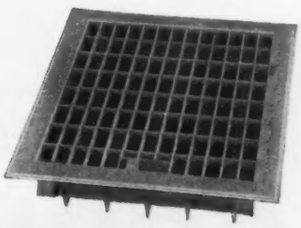
Flawless 'EGAD!

. . . and so says every installer that has inspected the new H & C No. 210 Series Floor Registers. They match our "NO-FLEX," grid type Cold Air Faces and are built in the same superb fashion—Narrow mesh to avoid catching heels and to effectively conceal the duct work, Flush intersections for better appearance, Margins that are straight as a die and narrow for close installations — beveled for strength, Invisible corner joints, Carefully aligned members, Exceptionally large air capacity.

See your H & C jobber NOW about these new registers!

NO. 210
FLOOR REGISTERS

Available in the same sizes and finishes as class No. 200, long the country's most popular pressed steel floor register.



HART & COOLEY MFG. CO.
CAST AND STEEL H&C WARM AIR REGISTERS
GENERAL SALES OFFICE 61 W. KINZIE STREET, CHICAGO

RACKETEERS OF WASTE

YOU always lose

when you gamble with these three Racketeers

Sheet metal satisfaction begins with YOUR sheet metal decision. You always lose when you take chances with Wear, Weather and Corrosion, these three arch enemies of sheet metal, whose toll mounts into millions annually.

When you use GOHI Pure Iron-Copper Alloy you know that you are getting the utmost value for your money, because GOHI is the longest-lasting, low-cost ferrous metal you can buy.

For every purpose GOHI is the logical choice of exacting sheet metal buyers, whether the job requires a single sheet or several hundred tons. Get all the facts about GOHI. Samples and complete information on request.

GENUINE OPEN HEARTH IRON GOHI PURE IRON - COPPER ALLOY

GOHI Pure Iron-Copper Alloy is available in all sizes and gauges. Produced exclusively by The Newport Rolling Mill Co., Newport, Ky.

GOHI SHEET METAL

PRONOUNCED "GO-HIGH"

THE NEWPORT ROLLING MILL COMPANY . . . NEWPORT, KENTUCKY

With The Manufacturers . . .

Armco's Symphonic Band Broadcasts

Ferde Grofe, famous arranger and composer of modern American music, has been retained by The American Rolling Mill Company to make thirteen symphonic band arrangements. These will be played for the first time by Armco's famous band under the direction of Frank Simon over the NBC Red Network and Southwestern Stations.

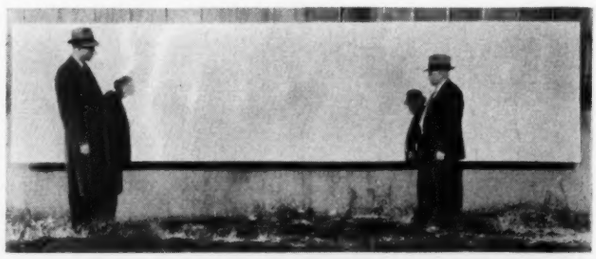
Though many noted composers have written band music, modern symphonic band arrangements are very rare. In securing these modern arrangements, critics say that Armco is taking a forward step in building even a wider listener audience for its famous band. The premiere of the first arrangement occurred on December 23rd.

In order to increase the public's appreciation for the sheet metal contractor and his constantly expanding field of service, several Armco broadcasts have been devoted exclusively to that end. A recent broadcast was written especially to carry the message to the general public that the sheet metal contractor did far more than to install gutters, downspouts and metal roofs. It pointed out that he was an artisan, doing great industrial jobs, working on huge buildings with galvanized metal and stainless steel and performing a wide variety of other important services.

◆

Largest Sheet of Stainless Steel

The illustration with this item shows a picture of what is claimed to be the largest sheet of mirror finished stainless steel ever made in this country.



The sheet is Enduro stainless steel and measures 230 inches by 54¾ inches. The sheet was produced by Republic Steel Corporation, Central Alloy Division, Massillon, Ohio. The sheet is eleven gauge and is to be shipped to Danzig, Poland.

◆

Furnace Pipe and Fittings Industry

The Supplementary Code Authority for the Warm Air Furnace Pipe and Fittings Manufacturing Industry, a Division of the Fabricated Metal Products Manufacturing, Metal Finishing and Metal Coating Industry, has submitted an application for a ruling on the definition of the Code for that industry, which would interpret said definition to include stove pipes and elbows. Article II, Section 1 of said Code reads as follows:

"The term 'Warm Air Furnace Pipe and Fittings Manufacturing Industry' as defined herein means the manufacturing for sale or exchange of warm air furnace and flue pipes, elbows, or fittings manufactured from galvanized steel or iron, tin plate, black steel or iron, or other basic materials used in substitution thereof."

The Code Authority has submitted the following facts:

1. Flue pipes are pipes through which hot air, smoke or other gases are conveyed away.

2. Stove-pipes and stove-elbows are metal pipes used for conveying away smoke and other gases.

3. Stove-pipes are in all respects similar to furnace pipes including the purposes for which they are made and used, the materials of which they are manufactured, the method of manufacture and distribution.

4. Although so called stove-pipes and stove-elbows are in all respects similar to furnace pipes and furnace elbow pipes, pipes and elbows made of black iron or steel are commonly referred to in the industry as stove-pipe, whereas similar pipe and elbows made of galvanized iron or steel are commonly referred to in the industry as furnace pipe and elbows.

5. Stove-pipes and elbows are manufactured principally by firms engaged in the manufacture of furnace pipe, elbows and fittings.

Gutters On World's Largest Distillery

(*Continued from page* 13)

flashing was installed where vertical brick walls rise at right angles to pitched roof. One of the photographs shows a typical such point. The flashing used was 10 by 10-inch bent in the middle. The top flashing was set in the brick work three bricks above the pitched roof. The sheet was carried down flat against the brick and then turned out over the shingles. The apron was cut wider than the upright section to provide a lap for the flashing sheet below. The result is that the flashing lies on the shingles with a laid lap like the shingles. As the photograph shows, the flashing pieces were caulked into the brick joint and then all flashing sheets were soldered on the vertical seams.

Downspouts

All exposed downspouts are round, corrugated copper let into the gutter bottoms without any head and completed with a 45-degree elbow at the bottom. Splash plates were provided at the mouth of the downspout where they empty on the roof.

The large conductor pipes for the large roof areas are inside soil pipe.

Eaves

The eave ends of all buildings are protected by copper facing which is flashed under the shingles and nailed, then brought down over the face of the eave and under the eave strip in the form of a drip. One of the details shows the construction. Several hundred feet of this material required all made from 12-inch strip copper.

Erection

All copper was delivered at a field shop in the flat. A 10-foot brake and necessary equipment was installed in this shop so that the copper could be formed and assembled on the job. During the course of the job the field shop caught fire, burning away part of the roof and walls, necessitating rebuilding about half the shop.

The larger part of the erection work was done in the winter, a situation which was further complicated by the fact that the buildings stand exposed on the river bank where severe winds are common.

The prefabricated gutters were hung from the roof and walls without scaffold by hanging the gutters just after the steel decking material was laid and before the shingles were placed. This made it necessary to maintain a flexible field force so that metal work could be carried along with the steel deckers and have the gutters and flashings in place before the shingle and insulating men. The field force varied from five to twenty-five men according to the work requirements.

AMERICAN STEEL SHEETS
FOR ALL KNOWN USES
KEYSTONE COPPER STEEL — AMERICAN SHEET AND TIN PLATE COMPANY
In Industry and Construction
Use sheets of recognized reputation and value. For roofing, siding, gutters, spouting, air conditioning systems, and general sheet metal work — Keystone Copper Steel *gives maximum rust resistance.*
Insist upon AMERICAN Black Sheets, Keystone Rust Resisting Copper Steel Sheets, Apollo Best Bloom Galvanized Sheets, Galvannealed Sheets, Heavy-Coated Galvanized Sheets, Formed Roofing and Siding Products, Tin Plates, Terne Plates, Black Plate, Etc.
Write us relative to your sheet steel requirements. This Company also manufactures U S S Stainless and Heat Resisting Steel Sheets and Light Plates for all purposes.
AMERICAN SHEET AND TIN PLATE COMPANY, Pittsburgh, Pa.
Subsidiary of United States Steel Corporation

WHITNEY LEVER PUNCHES
No. 4B PUNCH
Length—8½ inches. Capacity ¼-inch through 16 gauge. Deep Throat—2 inches. Weight—3 pounds. Punches and Dies—⅛" to ⅜" by 64ths.
No. 91 PUNCH
Capacity — ⅝-inch hole through ¼-inch. 1-inch hole through ⅜-inch and 2-inch hole through ½-inch iron. Depth throat 5-inches. Weight — 32 lbs.
No. 1 PUNCH
Length — 34 inches. Capacity — ⅜-inch hole through ¼-inch iron. Punches and dies in sizes from ⅛ to ⅜ by 64ths.
No. 2 PUNCH
Length — 23 inches. Capacity — ⅜-inch hole through ¼-inch iron. Punches and dies in sizes ⅜-inch to ½-inch by 64ths.
No. 6 PUNCH
Length — 26½ inches. Capacity — ¼-inch hole through ⅜-inch iron; especially adapted for button punching or templet work. Punches and dies ⅛" to ⅜" by 32nds.
CHANNEL IRON PUNCH
Companion to No. 2 Punch. Every part of the two Punches Interchangeable. Including punches and dies. Capacity — ½-inch hole through ¼-inch iron.
We have tools for every purpose needed by Sheet Metal Contractors.
Ask your Jobber
W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

PERFORATED METALS

ORNAMENTAL GRILLES

In Bronze — Aluminum
Brass — Steel
Copper — Monel
Stainless Steel

In All Finishes

Many beautiful designs to select from in the Moderne and other original styles as well as all standard patterns. H. & K. Perforated Metal Grilles are suitable for the finest modern buildings and are unexcelled for beauty, workmanship and finish.

Perforated Metal For Every Use

The Harrington & King PERFORATING CO.

5649 Fillmore St., Chicago, Ill. New York Office, 114 Liberty St.

THIS PROFIT OPPORTUNITY IS KNOCKING AT YOUR DOOR

All in the world you have to do to prepare yourself to make more money is to fill out and return the coupon in this advertisement. It will require less than a minute of your time to do this, and it can easily be the means of enlarging your income and business year after year far into the future.

Plenty of others are making more money today because at some time in the past they accepted the invitation we are now extending to you. Try a Super Furnace Cleaner for 3 days at our risk. Within 3 days you can find out for yourself how hundreds of others in your business have added profit and volume by adding a Super to their equipment.

Send in the coupon. Get out and line up some furnace cleaning jobs. Put the Super to work the minute it arrives. Don't be afraid of tough jobs—we assume all risk of accidental damage. Start paying for your Super out of its earnings on trial or keep the money and ship the Super back. Could anything be fairer? Then act.

USE THIS COUPON

The National Super Service Company,
1944 No. 13th Street, Toledo, Ohio.
Send me a Super Suction Cleaner for free trial for 3 days after arrival.
Tell me all about the Super and the free trial offer.

Name .....
Street and Address .....
City and State .....

New Literature . . . .

For your convenience in obtaining copies of New Literature, use the coupon on page 75.

215—Sales Company Manual

The Grand Rapids Furnace Cleaner Company, Grand Rapids, Michigan, announce that they have available the revised "A Plan to Increase Your Sales."

This is compiled in the form of a booklet telling actual methods successfully employed by dealers in building their business through furnace cleaning. The revised book takes into consideration the most recent business conditions and shows the plans that have been most effective in getting business under our actual conditions of today.

This booklet is available without charge to any accredited furnace dealer by writing direct to the Grand Rapids Furnace Cleaner Company, Grand Rapids, Michigan.

◆

216—Gas Burner Catalog

The Barber Gas Burner Company, 3702 Superior Avenue, Cleveland, Ohio, announces a new catalog to supplant the present catalog No. 34. The new catalog illustrates and fully explains the company's six new models of burners with safety pilot control. Each of the new burners will be supplied in several sizes. Catalog also illustrates the company's conversion burner models equipped with modern safety pilot controls.

New in this catalog is a section devoted to information on proper gas cocks and valves which should be used with the company's line of burners. There is also included an accurate detailed chart of information on the improved gas pressure regulator line.

The company will be glad to send copies of this new catalog to interested contractors.

◆

217—Brush Folder

Schaeffer Brush Mfg. Company, 1009 South Second Street, Milwaukee, Wisconsin, has prepared a small leaflet describing the company's line of radiator, furnace, boiler and flue brushes. An illustration shows each type of brush accompanied by a description of the brush and a table of dimensions. Each particular brush also has some information describing proper use.

◆

218—Through-Wall Flashing

The American Brass Company, Waterbury, Connecticut, announce a new leaflet "Anaconda Through-Wall Flashing." The leaflet describes and explains the Anaconda through-wall flashing while illustrations show the sizes of the various types of flashings manufactured. Additional explanation is given for possible uses of the various types of flashings.

A one-page drawing shows such uses of flashings as are commonly specified by the United States Government and architect's offices.

The company is also mailing a mimeographed sheet entitled "Answers to Questions which may arise while discussing Anaconda Through-Wall Flashing." The sheet is arranged in question and answer form and contains answers to such questions as: "What is through wall flashing;" "What is its purpose"; "Should a through wall flashing be formed or may it be plain;" "Is Anaconda flashing approved by the Treasury Department." Ten possible advantages of Anaconda copper flashing are also covered in this mimeographed sheet. A suggested specification for through wall flashing is also provided in mimeographed form.

◆

219—Packaged Blower Leaflet

The Furblo Company, Hermansville, Michigan, announce the publication of a new four-page leaflet covering their new packaged unit. The leaflet shows a large illustration of the unit with its accompanying controls, motor and filter equipment. Complete information on sizes, prices and some suggested ways in which the public can be informed as to the low cost and benefits of blower air conditioning are presented. A table of guaranteed performance ratings for the various types of units on a free air delivery basis and at customary resistances found in the average installation is also presented.

Michigan Convention

(*Continued from page* 59)

ceptions to this rule and from March 4 on, all combination plumbing and furnace, plumbing and sheet metal, hardware and heating and other types of shops must pay on the amount of business which they do in our industry. The only exception is where a firm overlaps within the construction industry, as electrical and furnace work, etc.

1935 Budget

Mr. Markle advised that the revised budget for 1935 contains varying assessment rates for each organized district and will be found to be in all cases considerably less than one per cent.

Editor's Note: *A full list of the assessments assigned to areas is published in this issue of* AMERICAN ARTISAN.

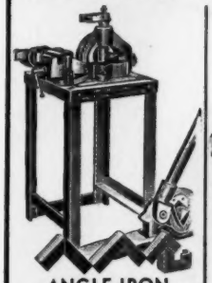
"The Federal Housing Program," was the subject of an address by Raymond M. Foley, State Director, Federal Housing Administration for the Detroit office. Mr. Foley presented in an interesting manner the underlying principles of FHA. Mr. Foley declared that FHA was one of the most constructive moves yet made by the Administration because FHA spends no government money, lends no government money and is designed to benefit the home owner who still remains the very basic unit in American social and economic life.

"FHA," declared the speaker, "is definitely organized for profit —profit for the contractor, profit for the manufacturer of products and profit for the home owner. This fundamental principle is frequently overlooked and is one of the prime reasons why FHA is destined to succeed. The whole principle of FHA is based on confidence—belief that people are still good credit, that a man's word is still a sound investment, and that the people still want and will buy the things they are accustomed to, if facilities are offered whereby they may buy.

Mr. Foley cited some of the problems of the credit situation. Previously, declared the speaker, practically any item might be bought on time and the American public has been educated to accept time-payment. Prior to FHA, the home owner was never able to buy a new roof, new sewer or repair and remodel under this partial payment plan except in isolated cases where interest rates were exceedingly high. The maximum interest rate of FHA is 9.82 per cent.

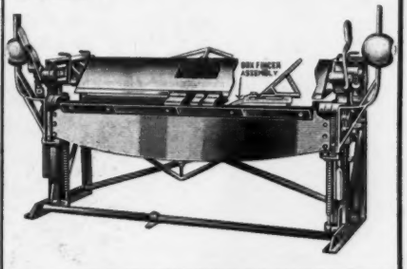
Said Mr. Foley—"FHA is the biggest promotional plan ever conceived. Today we have five years' accumulation of a desire for new homes, for home repairs, for greater comfort in the home, etc. The greatest curse of the depression has been fear and an inertia placed on the home owner. The basic organization of FHA contemplates four main phases—

WHITNEY TOOLS FOR THE SHEET METAL MAN



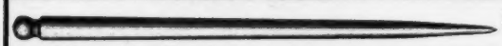
ANGLE IRON MACHINERY
A complete unit for working angle iron including shear, mitre notcher and bender.

WHITNEY JENSEN
Combination Bending and Box Brake. Has 17 distinctive points of superiority. Send for descriptive literature.

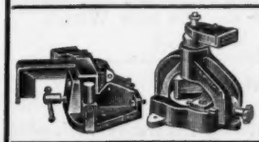


NO. 20 BALL BEARING PUNCH
Capacity 1/8" through 1/2" iron. Will also drive rivets. Made of alloy steel and heat treated throughout.

BALL BEARING PUNCHES
A complete line of all sizes with a complete range of sizes in punches and dies.



SCRATCH PINS



ANGLE MITRE NOTCHER AND ANGLE IRON BENDER. Capacity 2"x2"x1/4". A pair of tools that every shop ought to have. They are Nos. 50-51 in our catalogue.

Rivets; Punches and Dies
A complete line. Write us regarding any problem you may have with regard to tools.

WHITNEY METAL TOOL CO.
91 FORBES STREET, ROCKFORD, ILLINOIS

FAULTLESS HEATER CORPORATION
CLEVELAND, OHIO
manufacturer of
FAULTLESS FURNACES
including
SERIES "C" FOR FORCED AIR INSTALLATIONS
ALSO
FURNACE REPAIR PARTS
(from the original patterns)
for the former Graff Furnace Company's

FAULTLESS
FAULTLESS-COMFORT
LACKAWANNA
RIVAL
COMFORT
CAPITAL
PHILADELPHIA
and other Graff Furnaces

The following Supply Houses carry a stock of these Repair Parts made from our original patterns:

PHILADELPHIA, PA.
Aetna Stove Co., Inc.
Central Stove Repair & Fdy. Co.
Standard Stove Repair Co.
United Stove Repair Co.
Weinstein Supply Co.
M. Stein
WASHINGTON, D. C.
Fries, Beall & Sharp Co.
NEWARK, N. J.
Esolgroth & Co.
ALLENTOWN, PA.
Pennsylvania Supply & Mfg. Co.
SCRANTON, PA.
Samuel Weinberg & Sons, Inc.
WEST PITTSTON, PA.
Thos. R. Davis Co.
MILWAUKEE, WIS.
The Speich Company
BOSTON, MASS.
Huse & Carleton, Inc.
Henry N. Clark Co.
NEW YORK CITY, N. Y.
Faultless Range & Mfg. Co.
CHICAGO, ILL.
Associated Heater Parts Co.
YOUNGSTOWN, OHIO
Banner Repair Parts Co.
ROCHESTER, N. Y.
Henry Siebert Sons, Inc.
PITTSBURGH, PA.
The Graff Company
A. H. Johnson Co.
Shambien Furnace Parts Co.
WILKES-BARRE, PA.
White Hardware Co.
Wilkes-Barre Hdw. & Stove Co.
BALTIMORE, MD.
S. G. Kugler Co.
George J. Thaler, Inc.
BUFFALO, N. Y.
O. G. & D. H. Donaldson Co.
Minet Heating & Supply Co.
NEW HAVEN, CONN.
New Haven Stove Repair Co.
SHAMOKIN, PA.
Geo. B. Keiser
NEW BRUNSWICK, N. J.
New Brunswick Stove Co.
WILLIAMSPORT, PA.
Neyhart's, Inc.
GRAND RAPIDS, MICH.
J. Van Der Zee & Son

These Supply Houses can give you prompt service.

1—A huge advertising and publicity campaign has been under way for several months acquainting home owners and the construction industry with the benefits and set-up of FHA. 2—Canvassers have been organized in many communities to make a house-to-house canvass and list all of the repairs and betterments each home requires. 3—A follow-up of these pledges to see that the work pledged is actually done and that every bit of work which can be secured is turned over to the construction industry. 4—This has just started and contemplates the organization of schools for salesmen and contractors where actual and practical methods of selling FHA and home modernization and repair will be taught to anyone interested enough to attend."

"This," said Mr. Foley, "is the first time that the man buying a home has every assurance that he can complete purchase and actually own the home at the end of the buying term."

Some of the problems of code enforcement were discussed by Mr. Goodenau of the Detroit office of NRA. Mr. Goodenau declared that the aim of NRA is to convince men that the codes are a good thing rather than to take an individual into court and sue him for non-payment of assessment or non-code compliance. Mr. Ederle, secretary of the association, agreed with this statement by declaring that in Michigan every effort would be made to convince contractors of the value of code compliance rather than to drag contractors into court and sue or jail them for non-code compliance. "We are going through a period of evolution, not a period of revolution," declared the speaker.

The proper method of procedure in entering a complaint on fair trade practice was described as follows: the complaining contractor should secure from his local or state code authority a complaint blank or secure this blank from the local postmaster. All the information pertaining to the complaint must be filled in with names, dates, addresses and full information so that the data will stand up in court. This complaint, with the evidence, is to be mailed to the local NRA Compliance Office. The local office will attempt to adjust complaints, but if adjustment is impossible the complaint will be turned over to the legal department of NRA. The legal department of NRA then turns the complaint over to the proper district attorney who files suit in the Federal Court.

The business sessions of the convention were supplemented by a fish fry on the second night of the convention and a banquet tendered by the Michigan Salesmen's Auxiliary on the concluding evening.

FIRST IN NEW YORK

APOLLO ChromCopper has the distinction of being the first material of its kind ever used in New York City for a marquise. Above photograph shows beautiful decorative installation erected on Edison Hotel, New York City: APOLLO Pre-finished Copper is chromium plated polished or satin finished copper — attractive, durable, economical, rust and tarnish-resisting.

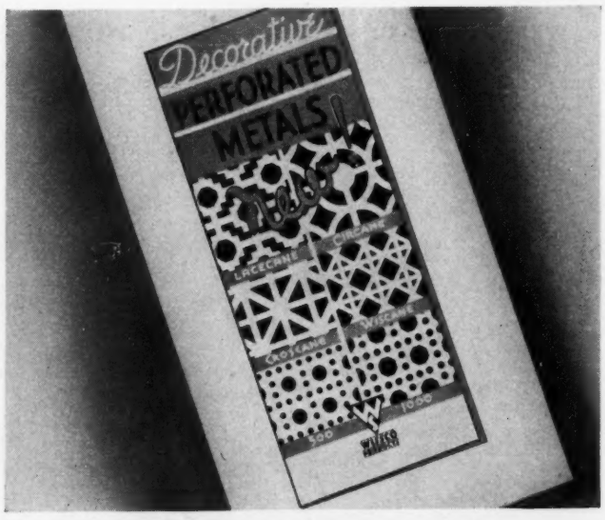
APOLLO CHROMCOPPER

Especially recommended for restaurant equipment, ice cream cabinets, table tops, shelf covering, range hoods, drain boards, etc., etc.

Apollo ... for QUALITY and SERVICE! LA SALLE

Special folder on Edison Hotel installation, showing details and photographs, and generous free sample, sent on request.

APOLLO CO. Box A La Salle, Ill.



A NEW FOLDER

on Decorative Perforated Metals

New uses of Decorative Perforated Metals demand more attractive period designs and increased free air space. Send for this folder and see the new Wissco Designs.

WICKWIRE SPENCER STEEL COMPANY
41 East 42nd St., New York City

Please send me your New Folder featuring Decorative Perforated Metals.

Name .....
Street .....
City ..... State .....

New Literature . . . . . .

For your convenience in obtaining copies of New Literature, use the coupon on page 75.

220—Reference Manual of Registers and Grilles

Hart & Cooley Manufacturing Company, 61 West Kinzie Street, Chicago, Illinois, announce a new reference manual of registers and grilles for air conditioning and ventilating installations.

The booklet is a reprint from Sweets architectural file and is so designed as to present full engineering details of register and grille selection. Some interesting tables are presented, such as a table of volume capacity of grilles. The tables are based on a formula for registers and intakes and give the register flange size for baseboard and sidewall registers and return air intakes under velocity ranges from 200 to 800 feet per minute. The various designs of grilles are shown by illustrations with drawings indicating the dimensions and tables giving free air capacities with and without valves for all sizes of registers in each particular designed group. The company's directional flow grille is shown by photographs and sketches indicating the general construction and the way in which the grille controls the flow of air. A table of directional air flow charts is highly interesting in that they show the areas of air movement from the various types of directional flow registers. These charted drawings give the contractor engineering data covering what may be expected in the way of air flow from the various types of registers and grilles.

The last part of the catalog shows the various types of registers manufactured with drawings indicating the proper methods of installation.

◆

221—Pressed Steel Products Leaflet

A leaflet, describing sheared plates, pressed shapes and steel blanks, is announced by the By-Products Steel Corporation, Coatesville, Pa. The inside pages show many of the sheared, blanked and pressed forms manufactured by the company.

Contractors interested in this type of material may obtain copies by addressing the company at Coatesville, Pa., or Broad Street Station Bldg., Philadelphia, Pa.

◆

222—Fine Finishes Make Fine Products

The above title applies to a four-page leaflet recently issued by the American Rolling Mill Company, Middletown, Ohio. The leaflet deals with Armco stainless steel 18-8 and 17.

The purpose of the leaflet is to explain finish. The text explains how important finish is in the product fabricated and how the manufacturer takes special care to protect the finish on the stainless steel sheets. Some facts regarding the life, use and method of handling stainless steel sheets are also suggested in the leaflet. A table is used which shows the answers to some particular problems, such as, heat treatment, cold working, welding, riveting, grain growth, brazing, etc.

◆

223—Welder Leaflet

A two-page leaflet, describing the alternating current, motor-driven, type SAC-300 and SAC-500 portable welders, manufactured by Lincoln Electric Company, Cleveland, Ohio, has been published by the manufacturer.

The leaflet describes this motor-generator type of arc-welder, taking 2-phase and 3-phase alternating current of standard voltages and frequencies, and some improved features of design and operation. Controls, general construction and optional equipment are explained, together with a table of dimensions for the two units.

◆

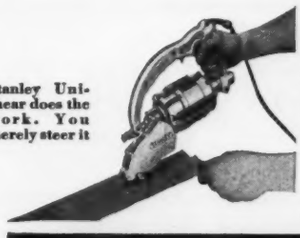
224—Ventilator Leaflet

The Racine Sheet Metal Works, Racine, Wisconsin, manufacturers of the "Spinner-Top" ventilators, has prepared a small four-page leaflet describing the ventilator and giving a table of displacement capacities. Full information on prices of galvanized and copper ventilators is also included.

EASIER TO HANDLE THAN a pair of SNIPS

The Stanley "Mighty Midget" Unishear makes better workmanship less difficult. It is easier to handle than a pair of snips and does smoother, cleaner work. For cutting any sheet material up to 18 U. S. Gauge hot rolled steel or galvanized iron, it is the fastest shear you can buy. It cuts straight lines, curves, angles or notches with hair line accuracy.

There is only one way to discover how useful the "Mighty Midget" can be—that is to see it in action. We will be glad to demonstrate it for you. Just write to



Stanley Unishear does the work. You merely steer it

STANLEY ELECTRIC TOOL DIVISION
The Stanley Works
131 Elm Street
NEW BRITAIN, CONN.

For Fast Cutting . . **STANLEY UNISHEAR**

STANLEY UNISHEARS ARE AVAILABLE FOR CUTTING MATERIAL UP TO ¼" BOILER PLATE

Boomer Boiler Plate Furnaces

Also made with duplex grates and upright shaker.

Have been successfully made for 22 years. Where introduced have given satisfactory service. The fire pot liners are the best we can buy and we know of several Boomers that still have the original liners in, which are 22 years old. We have been making cast iron Boomers for 50 years.

If you are interested in selling a strictly high grade furnace, ask for prices and agency.

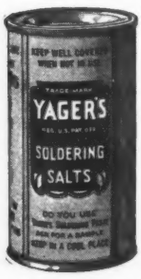
Nothing but the best of material enters into the making of Boomers.

When repairs are needed, avoid risk of dissatisfaction by ordering direct from the original patterns. Prices are low.

We sell to legitimate dealers only.

THE HESS-SNYDER CO., MFRS.
Massillon, Ohio

YAGER'S SOLDERING SALTS



Save time and solder! No fumes . . . no acid . . . no corrosion . . . will not streak or discolor the work . . . assures perfect electrical and mechanical joint. Packed in one-half pound . . . 1 pound and 5 pound cans . . . also in 25 pound and 50 pound enameled drums. Full direction for use on each can.

Write Dept. "S"

ALEXANDER R. BENSON, Inc.
HUDSON • • • NEW YORK

HEATING

CENTRAL FURNACE & STOVE REPAIR CO.
3937 OLIVE ST. ST. LOUIS, MO.

Stove — Furnace — Boiler
REPAIRS

VIKING—the Shear that good craftsmen prefer

Viking shears are the choice of good workmen. They have power and balance—cut true to the very tip of the cutting edges. Hence, better jobs done in quicker time.

Send today for complete information.

VIKING SHEARS
VIKING SHEAR CO., ERIE, PA.

If YOU don't know...

how superior Rubyfluid Soldering and Tinning Flux really is, just try it! No harmful effects from fumes or acids. No destructive corrosion. No discoloration. And it does make perfect joints! Send for sample.

RUBY CHEMICAL CO.
74 McDowell St. Columbus, Ohio

Rubyfluid

New Literature . . . .

For your convenience in obtaining copies of New Literature, use the coupon on page 75.

225—Nail Leaflet

The Angell Nail & Chaplet Co., Cleveland, Ohio, have just issued a brochure on nails in which they analyze a nail from the standpoint of construction, use and serviceability. It shows the strong, as well as the weak points, in nail construction and the results experienced in actual use.

A copy will be sent to any reader on request.

◆

226—Indoor Climate Leaflet

A four-page leaflet, showing the application of window-type air conditioning units, has been prepared by the Air Conditioning Division of Savage Arms Corporation, 100 East 42nd Street, New York City. The Savage Company is now making four types of indoor air conditioners—a basement type, two floor types and a window box. Photographs used in the booklet show the difference between dry, stuffy air and pure, energizing air in homes and offices. Suggested methods of using the cabinet conditioner on window sills and on tables or above registers and radiators are shown by photographs and explained in the text.

The leaflet is written for consumer sales presentation and explains in detail the dangers of dry, stuffy air as compared with the advantages of invigorating air conditioning. Leaflets may be obtained from the company.

◆

227—Roofing and Insulating Leaflets

The Ruberoid Co., 500 Fifth Avenue, New York City, announces a number of new leaflets describing the company's products. One leaflet shows and explains "Supercell," a new pipe covering.

A second leaflet describes the company's line of asbestos, magnesia and high temperature cements. Information on coverage, temperature resistances, and other pertinent information is contained in this leaflet.

Other leaflets describe the company's line of Ruberoid-Watson sheet insulation.

"Woolfelt," insulation for hot or cold pipes to prevent sweating and furnish covering having little weight, is described in the last leaflet.

Copies of all these leaflets may be obtained from the company.

◆

228—Faucets, Valves, Fittings

Central Brass Mfg. Company, 2950 East 55th Street, Cleveland, Ohio, has published a pamphlet entitled "Faucets, Valves and Fittings" for industrial use. The booklet shows the company's line of brass valves and fittings, both standard stock and specialty items. Of particular interest to the furnace heating, ventilating and air conditioning field are the company's lines of Globe valves, compression stops, strainers, pressure regulators and stream controls. Each item is illustrated and accompanied by an explanation of sizes, catalog numbers and a brief description of the most important features.

"I'd Rather Give Up My Whole Shop Than Give Up My Tornado Furnace Cleaner. Nothing Pays So Well"

An energetic furnace dealer in South Dakota believes furnace cleaning service is the greatest aid to the sheet metal worker.

He says, "Furnace cleaning gets you into homes that could never be approached by any other method." What an ideal plan for obtaining business under the FHA plan and securing profitable repair and replacement business.

Keep step with the times and modernize your sales and service with the Tornado Furnace Cleaner—complete tools (chimney cleaner if desired), great power, more Tornado cleaners in use than any other type. Write for Free Trial offer.

Breuer Electric Mfg. Co.
865 Blackhawk Street, Chicago, Ill.

New Literature . . . .

For your convenience in obtaining copies of New Literature, use the coupon on page 75.

229—Steel Furnace Folder

A new folder entitled "A New Comfort," showing the cut-away construction of a new steel furnace and giving full information on the details of design and construction, is announced by Joliet Heating Corporation, Joliet, Illinois.

The leaflet also contains a table of prices, dimensions and capacities.

◆

230—Boiler-Air Conditioning Unit Leaflet

Dail Steel Products Company, Lansing, Michigan, have published a new piece of literature describing the company's unit air conditioner for connection to steam, hot water or vapor boilers.

The leaflet describes the general boiler-air conditioning system as a whole and gives full information on details of construction, design and operation of the conditioner.

The new unit is equipped for positive cooling when connected to a "cold" supply; it circulates the air by means of twin blowers; has filters for cleaning the air and can be used for winter conditioning.

The leaflet gives full information on ratings for heating, cooling with refrigerants, cooling with water; with complete details as to C. F. M., air temperatures, Btu's, final temperatures, etc.

Contractors interested in air conditioning homes heated by boilers are invited to write the company for copies of this leaflet and data sheet.

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave., Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Check numbers in which you are interested):

111	112	113	114
115			
215	216	217	218
219	220	221	222
223	224	225	226
227	228	229	230

Name..... Title.....

Company .....

Address .....

NATIONAL WARM AIR HEATING & AIR CONDITIONING ASSOCIATION

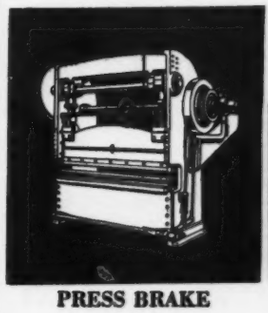
SPEAKERS BUREAU

Will supply speakers for meetings of contractor and civic groups without charge . . . subjects on warm air heating and air conditioning. Technical and non-technical speakers should be booked at least 10 days in advance of meeting.

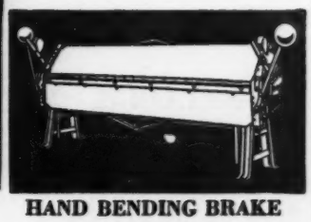
Write for Full Particulars . . .

J. D. WILDER Committee Member

c/o American Artisan, 6 N. Michigan Ave., Chicago



CHICAGO



PRESS BRAKE HAND BENDING BRAKE

Steel Brakes—Presses—Shears

DREIS & KRUMP MFG. CO.

7404 LOOMIS BLVD. CHICAGO

Install

ÆOLUS *Improved* **VENTILATORS**

FOR industrial buildings, schools, homes, theaters, etc. Made in 14 different metals. Constant ventilation—no noise—no upkeep.

ÆOLUS DICKINSON

Industrial Division of Paul Dickinson, Inc.

3332-52 South Artesian Avenue

Chicago, Ill.

ALL REPAIR PARTS for FURNACES BOILERS STOVES RANGES

A.G. BRAUER SUPPLY COMPANY

316 NO. THIRD ST. + SAINT LOUIS

IN STOCK • READY FOR IMMEDIATE SHIPMENT

EXPERT SOLDERING

Available in 1, 5 and 20 lb. spools.

is made easier with *Gardiner Flux-Filled Solder*—it enables experienced mechanics to do faster work and inexperienced help to do neater work. Its high tensile strength assures permanent bonds.

Due to the most modern methods of production this quality brand of solder costs no more than ordinary solders.

We also make a complete line of bar and solid wire solders and babbitts.

Gardiner METAL CO.

4831 So. Campbell Avenue

Chicago, Illinois

Keep in Step!

PLAN TO ATTEND . . .

NATIONAL CONVENTION
of the
OIL BURNER DEALERS
of the
UNITED STATES

•

PENNSYLVANIA HOTEL
New York City
APRIL 2nd and 3rd, 1935

•

MERCHANDISING INFORMATION OF VALUE
GRAND BANQUET AND BALL ON APRIL 3rd
SPEAKERS OF NATIONAL REPUTATION

•

Reduced railroad rates on certificate plan
Hotel and meals to fit any pocketbook

•

For details wire or write
NATIONAL OIL BURNER DEALERS ASSOCIATION INC.
551 Fifth Avenue, New York, N. Y.

DeWITT OPERATED HOTELS

featuring—
Unusually Comfortable Rooms, Good Food, Carefully Prepared, and Rates from $2.50 Single

In Cleveland it's
The HOLLENDEN
RADIO IN EVERY ROOM

In Columbus it's
The NEIL HOUSE

In Akron it's
The MAYFLOWER
RADIO IN EVERY ROOM

In Toledo it's
The NEW SECOR

In Miami Beach it's
The FLEETWOOD
An Exclusive Winter Resort Hotel

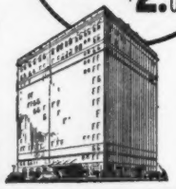
DeWitt Operated Hotels are located in the heart of their respective cities

Comfort
first and always at the
MELBOURNE

HOTEL
400 ROOMS WITH BATH
FROM $2.50 UP

A night's rest that's peaceful and refreshing - a pleasant atmosphere in the lobby - the warm glow that good food brings - the pleasant reaction that low prices give - these are the things that make the Melbourne the choice of every experienced traveler.

O. P. GREATHOUSE
Manager



ST. LOUIS
LINDELL BLVD. at GRAND AVE.

When in Buffalo

Enjoy the quiet of a fine hotel conveniently located to the business district yet away from downtown din. Meals that long remain a pleasant memory. Rooms that encourage rest. Rates $1.50 to $3.00 per day per person. Write for descriptive booklet and map of Buffalo.

HOTEL LENOX
140 North St. Near Delaware
Clarence A. Miner
President

Air Conditioning

—What happens between two rooms, one having a six minute air change, and the adjoining room a twelve minute air change?
—Can you install a thermostat control system properly?

The answers to these and hundreds of other mechanical questions about air conditioning are appearing in the monthly *Air Conditioning Section* of AMERICAN ARTISAN.

If you do not now get the ARTISAN, send us $2 and we will enter your subscription for a full year—12 consecutive issues. Your subscription will yield a rich harvest of money making ideas and solutions to many mechanical problems connected with warm air heating and sheet metal contracting.

AMERICAN ARTISAN
6 North Michigan Ave. Chicago, Ill.

CLASSIFIED ADVERTISING

4 cents for each word including heading and address. Count seven words for keyed address. Minimum $1.00 for each insertion. One inch $3.00. Cash must accompany order. Copy should reach us eight days in advance of publication date. Display rates for this page will be furnished on request.

SITUATIONS WANTED

SITUATION WANTED BY SHEET metal worker—past 50 years of age. Experienced in heating, ventilating, blow piping, cornice and skylight work. Wages no object. Best of references. Address Key 311, "American Artisan," 6 N. Michigan Ave., Chicago, Ill.

SITUATIONS OPEN

OPPORTUNITY—WE NEED FIRST class salesmen to represent us on the sale of Soot Destroyer, Boiler Water Treatment and Anti-corrosion Liquid for air conditioning units. Attractive propositions to the right man. Saginaw Salt Products Co., Saginaw, Michigan.

SALESMAN WANTED: MANUFACTURer with complete line of furnaces, boilers and water heating equipment has open territory in Wisconsin, Illinois, Virginia, North Carolina and Indiana. Liberal commission basis. Our own men know of this advertisement. Address Key 304, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

SALESMAN WANTED: VERY LARGE manufacturer with complete line of steel gravity furnaces and air conditioning units wants high class salesman for northern Ohio-Michigan territory. Must be thoroughly experienced in gravity and forced air heating—between 30 and 40 years of age and with a proven record of real sales ability. A fine opportunity for the man who can qualify. Address Key 309, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

WANTED TO BUY

WANTED: SLIP ROLL FORMING Machine, hand operated, to handle 12 gauge and lighter, 36" iron. Must be in A-1 shape and reasonable. Huron Furnace Company. Huron, South Dakota.

FOR SALE

FOR SALE: A GOOD SHEET METAL and furnace business, in town of 2,000. A real good business for the right man. Good reason for selling. Address Key 308, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

FOR SALE: SHEET METAL SHOP—county seat, town of 3500 population, Central Wisconsin. Rent reasonable. Address Key 310, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

Manufacturers Agents

MANUFACTURERS WANTING ADditional representation often come to us for names of prospective agents now handling other lines in this field on a commission basis in a definite territory. It will pay you to be on record with us so we can refer your name to interested manufacturers. No charge or obligation, of course. It is a service we render free to manufacturers and representative. Just drop a line that you are interested in being on file and we will send you form to fill out. Address American Artisan, 6 N. Michigan Ave., Chicago, Ill.

FOR SALE

SHEET METAL WORKING MACHINERY AND TOOLS

●

Rebuilt - Trade - In Machinery

●

Angle Iron Cutters	**Grinders**
Beading Machines	**Punches**
Bending Brakes	**Shears**
Bar Folders	**Turners**
Groovers	**Rollers**

Write for Stock List

MAPLEWOOD MACHINERY CO., Inc.
2434 Fullerton Avenue, Chicago, Ill.

Use AMERITAN ARTISAN Classified Advertising for quick results. It puts you in direct touch with the buyers and sellers in the warm air heating, sheet metal contracting and air conditioning industry.

? ? ? ? ? ?

HAVE YOU A SHEET METAL PROBLEM: FORMING—BENDING—PUNCHING—SHEARING

WE HAVE A MACHINE FOR EACH OPERATION ON SHEET METAL

Your Inquiries Earnestly Solicited

WARD MACHINERY CO.
SPECIALISTS
MACHINES — TOOLS — SUPPLIES FOR SHEET METALS
562 W. Washington Boulevard
CHICAGO, ILLINOIS

Patents and Trade Marks

Philip V. W. Peck

Barrister Bldg., Washington, D. C.

FOR SALE

BLAST GATES

Write for Price List. Standard Sizes Carried in Stock for Immediate Shipment.

ALFRED GOETHEL
1910 N. Killian Pl., Milwaukee, Wis.

BALL JOINTS

BOOKS
on
AIR CONDITIONING

The two best reference books published on this important subject:

"FORCED AIR HEATING"
by
PLATTE OVERTON
Size 6x9—184 pages—136 illustrations—cloth bound.

"AIR CONDITIONING FOR COMFORT"
by
SAMUEL R. LEWIS
Size 5½ x 8½—244 pages—130 illustrations—cloth bound.

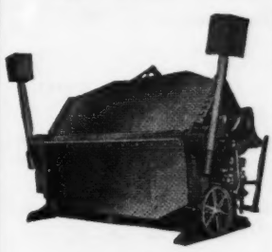
Price each $1.00

Remit with order to Keeney Publishing Company, 6 North Michigan Avenue, Chicago, Illinois.

If you have anything to sell, if you are looking for a "good buy," if you are seeking a connection or if you are looking for a salesman—use the Classified Page of AMERICAN ARTISAN.

SHEET METAL MACHINERY

"Draw on the MOST COMPLETE STOCK IN AMERICA"



"A MACHINE FOR EVERY PURSE AND PURPOSE"

SOME REBUILT BARGAINS

Shears, Power, 12'14 ga. Nia. M.D. & 10"⅜" Ohl.
Brake, Box & Pan, 8' 10 ga. Motor Drive. 5' 14 ga.
Roll, Power, 8' ⅝" Bertsch Initial Type. 42" 11 ga.
Ironworker, Pels, 4x4x½". No. 2 Buffalo.
8 Ft. and 5 Ft. Niagara Power Shear, ⅜" cap.
15" gap. 6'¾" Williams & White.
Press Brakes, 10' 10 ga. Ohl: 10"⅜" & ¾" L&N.
New 1/3 H.P. Handy Elec. Grinder B.B..$35.00
Spot Welder, New—capacity 2 pcs. 16 ga..125.00
50—Bench Kick Presses, each..... 16.50
Ring & Circle Shears, Nia., Nos. 11, 13, 15.
Brakes, Chgo. St., Hand, 10'16; 10'14; 8'16; 8'18; 8'14; 6'16; 8'12; Power, 10'10; 8'¼".
Folders & Brakes Comb., 36", 42", 60".
16—Brand New Rapid Kick Punches, ¼"x10 ga. 6" throat, each $45.00
Bench Punches, No. 16 Whitney; No. 10 Whitney Screw Punch.

DON'T Let Your Surplus Machinery Stand Idle. TRADE IT IN On Interstate-Guaranteed - Reconditioned Equipment.

We Carry America's Largest Stock Modern Machinery at prices that will suit your bank book. Let us quote.

NEW & USED

Send for Bulletin No. 835 listing modern requirements.
ROLLS — SHEARS — BRAKES — PUNCH PRESSES
BUTT, ARC & SPOT WELDERS — FOLDERS
PRESS BRAKES — HAND MACHINES — STAKES

HAND & POWER

INTERSTATE MACHINERY COMPANY
130 S. Clinton St. . . . . Chicago

Index to Advertisers

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in alternate issues is marked with an asterisk.

March, 1935

Acme Heating & Ventilating Co., Inc. 57
Aeolus Dickinson 75
Air Controls, Inc., Division of The Cleveland Heater Co.... 44
Allegheny Steel Co..... *
American Air Filter Co., Inc.... 39
American Brass Co. 5
American Radiator Company.. 28
American Rolling Mill Co., The 66
American Sheet and Tin Plate Co. 69
Anchor Stove & Range Co., Inc. 46
Apollo Company 72
Auer Register Co..... 45
Autovent Fan & Blower Co..... 46

Barber Gas Burner Co., The... 46
Benson, Inc., Alexander R..... 74
Berger Bros. Co..... 57
Bishop & Babcock Sales Co.... 41
Brauer Supply Co., A. G..... 75
Breuer Elec. Mfg. Co..... 74
Brundage Company, The..... *
Buffalo Forge Company..... 50

Canton Steel Ceiling Co..... 57
Capitol Furnace & Stove Repair Co. ..... *
Central Furnace & Stove Repair Co. 74
Clarage Fan Co..... 42
Cook Electric Co..... 47

Dail Steel Products Co..... *
Delco Appliance Corporation... 25
Detroit Lubricator Co..... *
DeWitt Operated Hotels 76
Dreis & Krump Mfg. Co..... 75

Eaglesfield Ventilator Co..... *

Faultless Heater Corp..... 71
Firelands Manufacturing Co., The ..... *
Fox Furnace Co., The..... 7

Gardiner Metal Co..... 75
General Electric Company..... 27
Globe Iron Roofing & Corrugating Co. 65
Grand Rapids Die & Tool Co... 46
Grand Rapids Furnace Cleaner Co. 63

Harrington & King Perf. Co.... 70
Hart & Cooley Mfg. Co..... 67
Henry Furnace & Foundry Co., The 64
Hess-Snyder Co. 73
Hess Warming & Ventilating Co. 44
Hotel Lenox 75
Hotel Melbourne 76
Hussey & Co., C. G..... 60

Independent Register & Mfg. Co. 8
International Engineering, Inc. 26
Interstate Machinery Co..... 77

Lau Heating Service, Inc..... *
Liberty Foundry Company.... 57
Lincoln Electric Co., The..... 9

Marshall Furnace Co..... 40
Maurey Manufacturing Corp... *
Meyer & Bro. Co., F..... *
Meyer Furnace Co..... *
Minneapolis-Honeywell Regulator Co. 24
Monarch Mfg. Works, Inc..... 47
Morency-Van Buren Division, Scovill Mfg. Co..... 43
Mt. Vernon Furnace & Mfg. Co. ..... *
Mueller Furnace Co., L. J..... .....Back Cover

National Foundry and Furnace Co. ..... *
National Oil Burner Dealers Assn., Inc. 76
National Super Service Co..... 70

Newport Rolling Mill Co..... 68
Northwestern Stove Repair Co. *

Oakland Foundry Co..... *
Osborn Co., J. M. & L. A..... 63
Owens-Illinois Glass Co..... 49

Parker-Kalon Corp. 6
Peerless Electric Co..... 45
Peerless Foundry Co., Inc., The 61
Penn Electric Switch Co..... 29
Practical Instrument Co..... *

Randall Graphite Products Corp. 48
Republic Steel Corp..... .....Inside Front Cover
Revere Copper & Brass, Inc... .....Inside Back Cover
Round Oak Co..... 62
Ruby Chemical Co., The..... 74
Russell Electric Company..... 3
Ryerson & Son, Inc., Joseph T. 10

Scovill Manufacturing Co..... 43
Stanley Works, Inc..... 73
Supreme Electric Products Corp. ..... *
Swartwout Company, The..... 42

Torrington Mfg. Co., The..... 48

United States Air Conditioning Corp. 48
U. S. Pressed Steel Products Co. 59

Victor Electric Products, Inc. *
Viking Shear Co..... 74

Walsh Refractories Corp..... *
Waterloo Register Co., The.... 50
White Mfg. Co..... 48
Whitney Mfg. Co., W. A..... 69
Whitney Metal Tool Co..... 71
Wickwire Spencer Steel Co.... 72
Wise Furnace Co., The..... *

Boston State House

Revere Products *protect the law*

IN 1798, atop Beacon Hill, Boston, the new state house stood completed. And yet not completed, because its dome was entirely of wood. In 1802, the commissioners decided to "secure it forever from the danger of fire and the effects of weather." This was done. The dome was sheathed in copper sheets from America's first copper-rolling mill, the mill of Paul Revere.

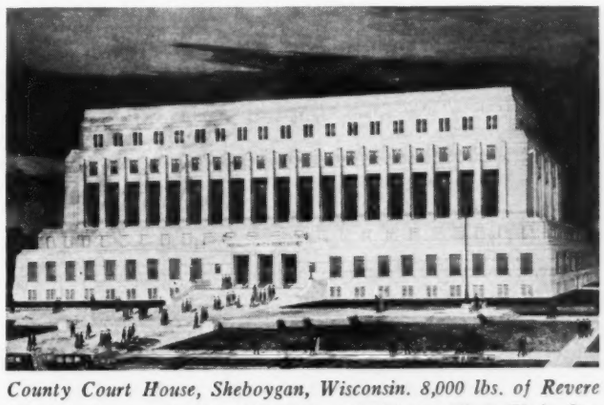
In the century and a quarter that followed, each succeeding generation has used Revere Copper, Brass and Bronze products to protect the public buildings of our country. These two modern examples are but representative of law-making and law-enforcing institutions throughout America that use Revere products for exterior protection.

Revere Sheet Copper and Revere Leadtex (the modern lead-coated sheet copper) were chosen because they guarantee rust-proof, leak-proof permanence. Because they acquire a mellow beauty as the years advance. And because copper saves money in the long run, since it lasts for years without repairs or replacements.

If you want to add to your own profits, sell the use of copper for roofs, flashings, gutters, downspouts and other sheet metal purposes. You'll find Revere Sheet Copper extremely workable. It comes in soft and hard tempers, and in a variety of finishes which will meet any requirement. And sell Revere Leadtex for beautiful and unusual decorative effects.

Count on the century-long, country-wide reputation of Revere to add prestige to your work. Added to your own skill, it will bring you more jobs and larger contracts. Sheet Metal Distributors in every section of the country carry stocks of Revere products. Why not use Revere on your next job?

State Capitol at Charleston, West Virginia. The dome is covered with stamped decorative panels of Revere Leadtex. The roof is Revere Copper, lead-coated. Architect: Cass Gilbert. Metal Contractor: E. Van Noorden Co., Boston. Stamped work: Miller & Doing, Brooklyn. Lead Coating: Wheeling Metal and Manufacturing Co.



County Court House, Sheboygan, Wisconsin. 8,000 lbs. of Revere Sheet Copper were used on this project. Architects: W. C. Weeks, Inc. and K. M. Vitzthum & Co., Inc. Associate Architects: Satre & Senescall. Sheet Metal Contractor: F. Geele Hardware Company.

Revere Copper *and* Brass

INCORPORATED

Founded by Paul Revere 1801

EXECUTIVE OFFICES: 230 PARK AVENUE, NEW YORK CITY · MILLS: BALTIMORE, MD. · TAUNTON, MASS. NEW BEDFORD, MASS. · ROME, N. Y. · DETROIT, MICH. · CHICAGO, ILL. · SALES OFFICES IN PRINCIPAL CITIES

NRA CODE

WORKING HAND-IN-HAND to help you

AS the building curve turns upward—as home improving and home building create new jobs by the thousand—here is your opportunity to profit to the fullest extent.

The complete Mueller line, Mueller-Milwaukee Finance Plan, and FHA combine to offer you every selling advantage for the big season just ahead. Now you can step out and write the orders which money shortage has dammed up so long. Not only can you offer just the equipment that is in demand but you can offer one to three years to pay, in small installments—moderate interest rates—freedom from red tape and complications. And you get your money on the nail!

WE ARE CO-OPERATING BETTER HOUSING PROGRAM

Let us give you full details on this 3-ply selling proposition that promises to make 1935 Your Banner Year.

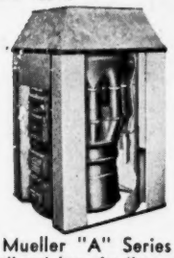
Liberal terms on stock or display equipment.

L. J. MUELLER FURNACE COMPANY, Dept. AA3, Milwaukee, Wis.

Branches and distributors in key cities everywhere

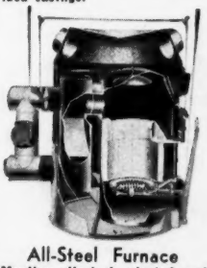
Mueller "F" Series

Mueller Full Front Furnace for volume business. Made in six sizes, both single and double door types. It's heavier—has higher "Standard Code" ratings—yet no higher in price. Also available in pipeless, three-way and room heater types.



Mueller "A" Series

—all cast iron—for those who want the best in a coal or oil burning unit. Seven sizes—20 to 33 inch firepots. Also available with round galvanized casings.



All-Steel Furnace

Mueller all-steel, riveted and welded furnaces for coal or oil burner—seven sizes, 20 to 34 inch drums, including Giant Radiator type. Dome protected by cast iron bell.

MUELLER – MILWAUKEE